

Flight, May 15, 1931

FLIGHT

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AND AIRSHIPS

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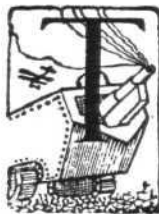
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EDITORIAL COMMENT



THE past few days have been saddened by the deaths of Glen Kidston and Flight-Lieut. Waghorn. The public, as usual, has put the two tragedies together and exclaimed that flying is still more dangerous than other forms of transport. Exactly the same thing is said whenever a pilot of a fighter squadron cuts things a bit too fine. In actual fact there is practically nothing in common between the accidents which caused the lamented deaths of these two fine pilots. Glen Kidston was certainly engaged in trying to spread the gospel of flying in South Africa, but the crash which caused his death and that of Captain Gladstone (another preacher of the same gospel) was due to taking chances on an air journey such as many another bold pilot has taken without any disastrous results.

Martyrs to Science

The case of Waghorn is entirely different. He was acting as a test pilot at the Royal Aircraft Establishment at South Farnborough. He had only just moved there from Felixstowe, where he had also been engaged on test work. The pilots of South Farnborough, Felixstowe and Martlesham are always engaged on work which entails a certain amount of risk. At South Farnborough the Royal Air Force grapples with its most intricate scientific problems. The theories and conclusions of the scientists have to be tried out in the air, and these flying tests have to be made by a staff of specially selected pilots. They must, in the first place, be pilots of great skill and experience. Secondly, they must be resolute men (as Sir John Simon said of the crew of R 101) who will calmly risk their lives to test out a theory. Finally, and this is quite as important as either of the other two qualifications, they must be men who can use their brains as they fly and can send in a critical and analytical report which will tell the scientific staff how far their theories have been justified in practice. Waghorn was an ideal pilot for this sort of work.

The details of the accident have not yet been published. The machine which was being tested was a "Horsley," with, we believe, a "Buzzard"

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1931

- May 15. London Air Defence Club Dinner at Trocadero.
- May 15-31. Stockholm Aero Show.
- May 16. Reading Ae.C. Meeting.
- May 23. Start of Whitsun Continental Cruise, Heston.
- May 23-25. Inter-Club Gliding Rally, Balsdean, Sussex.
- May 24. N.F.S. Air Pageant, Nottingham.
- May 25. Scarborough Ae. C. Opening Meeting.
- May 25-26. Northamptonshire Ae.C. Flying Meeting at Sywell.
- May 28-June 13. Royal Tournament at Olympia.
- May 30. Air Union Reception of Capt. Costes, Croydon Aerodrome.
- May 30. Heston-Newcastle Air Race, for "Newcastle Evening World" Trophy.
- May 31. N.F.S. Air Pageant, Sherburn-in-Elmet, Yorks.
- June 2. R.A.F. Middle East Dinner at Connaught Rooms.
- June 6. Brooklands Air Display.
- June 6. Lincolnshire Ae. C. Meeting at Cleethorpes.
- June 7. N.F.S. Air Pageant, Hull.
- June 8. International Rally, Bucharest.
- June 9. Air League "Speed" Ball at the Dorchester, Park Lane, W.
- June 13-14. Leicestershire Ae.C. "At Home" at Desford Aerodrome.
- June 20. Flying Display and Air Pageant, Bristol Airport.
- June 21. N.F.S. Air Pageant, Reading.
- June 26. R.A.F. Dinner Club Annual Dinner.
- June 27. Royal Air Force Display, Hendon.
- July 10-19. Circuit of Italy.
- July 22. Household-Brigade Flying Club Meeting, Heston.
- July 25. King's Cup Race.
- July 25-Aug. 9. Rhön Gliding Competitions, Germany.
- Sept. 5. Haldon Flying Meeting.
- Sept. 12. Schneider Trophy Contest.

engine. The Horsley, with "Condor" engine, survives still in the Royal Air Force as a torpedo-bomber. As a two-seater day-bomber it is obsolescent, and is being replaced by another Hawker-Rolls Royce machine, the "Hart." Still, lessons could be learnt by trying out the Horsley, which is a very fine flying machine, with a different type of engine. Waghorn was engaged on trying this combination, and he was accompanied by one of the engine experts of the R.A.E., Mr. Alexander. What went wrong we do not know, but the machine became uncontrollable and both men had to take to their parachutes at a height of about 500 feet. Alexander jumped first, Waghorn probably hung on to his machine till what he considered the last possible moment (again we are struck by a resemblance to the case of R 101) before he jumped. A strong wind blew him violently against a building, and this inflicted injuries which caused his death. If ever a man died as a martyr to the cause of science, it was Waghorn.

Other pilots engaged on test work have been killed before now, and it is only when tragedies happen that we stop to marvel at their rarity and still more at the courage of the pilots who constantly risk their lives on test work. In spirit they are one with the scientists who experimented with X-rays on their own bodies and paid a terrible penalty for so doing.

Waghorn was, of course, a national hero. The winner of a Schneider contest always seems a national possession. There has never been a more modest hero. During the training for the Schneider in 1929 our special correspondents at Calshot came in contact with all the members of the High Speed Flight, and in Waghorn they met a man whom to know was to like. At this moment of public sorrow at the loss of a great pilot, it is the personal memories which come to the mind. In offering our sympathy to Mrs. Waghorn, we can assure her that in a different degree we too share her sorrow.



We do not profess to be experts on the questions involved in the Government's proposals to tax the value of land. FLIGHT is not a political paper. It is concerned with the air and the craft which fly in the air. In the philosophy of this paper, land does not exist except as a basis for the taking-off of aircraft and the landing thereof. It is of no concern to us, editorially, if the Government contrives by means of taxation to cover every piece of land between Land's End and John o' Groats with large and possibly hideous blocks of tenements, provided only that space is left for aerodromes and landing grounds which aircraft can use at a not-prohibitive cost. But a suggestion that aerodromes may be taxed on

Taxing Aerodromes

No. 43 (Fighter) Squadron gets its "Furies"

FOR the past fortnight No. 43 (Fighter) Squadron at Tangmere has been in possession of its full complement of Hawker "Fury" interceptor fighters, in which the Rolls Royce "Kestrel" engine is installed. The complete number of machines, of which a fighter squadron has 12 in addition to reserves, was delivered to the squadron within 10 days. This, it will be generally agreed, is a very smart piece of delivery work by the H. G. Hawker Engineering Co. Ltd., of Kingston. Nothing is better calculated to deter a hostile nation from sending its bombers

their value as building land becomes a matter for protest.

Capt. Harold Balfour, M.P., raised this point in the House of Commons on May 7. Around London, he said, there are something like six privately-owned aerodromes. The closer to the Metropolis the greater is the value of an aerodrome to the aircraft industry, and the closer it is, the more valuable it is, and the more taxation the Government are going to put on aerodromes if owned by private enterprise. This step, argued the honourable and gallant member, would put a crushing burden upon an essential possession of the aircraft industry. It was a new industry, and we had to look to new industries to supply the place of some of the older industries which were dying or dead. Capt. Balfour presumed that every supporter of the Government would say that this new form of transport was all-important; yet the Government was, nevertheless, going to tax the site value of aerodromes.

We will admit that there are certain pieces of land which, if they are to do the greatest possible service to the community, ought not to be aerodromes. We have never been able to sympathise with the demand that Hyde Park should be converted into an aerodrome. Our editorial disregard for land as land will not carry us so far as that. We can even believe that some local bodies would be ill-advised to spend the substance of the ratepayers on acquiring an aerodrome which may never be of any practical use to the flying movement, and so will not give the ratepayers a return for their money. It would be just as foolish for a little fishing village which can never hope to become the terminus of a great steamship line to construct a huge harbour with docks and quays. But if authorities whose judgment is above question, and we gather that the Government valuers will be men of that authority, decide that a certain piece of land ought to be an aerodrome, then we consider that the land should be taxed (if at all) at a low rate on account of its utility to the public. Whether the aerodrome is owned privately or by a public body should be of minor importance. The question is whether that piece of land ought to be an aerodrome or not.

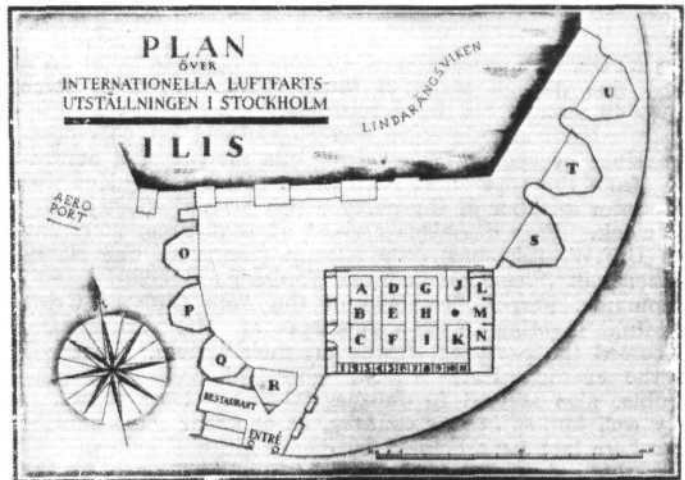
We confess that we should not like to have to undertake the task of deciding whether an aerodrome at Upper-Slocum-super-Mud was likely to become a vital link in the future network of air lines or air-tourist routes in this country. There are many other duties of the land valuers which we should not care to undertake. But there must be, and in fact there are, plenty of cases in which an aerodrome is clearly of importance and ought to be regarded as fulfilling the best purpose to which that particular piece of land could be put. To tax the value of that piece of land as a possible building site appears to us to be against all principles of equity and common sense.



across the narrow seas than the knowledge that a very heavy toll is sure to be taken of the raiders before they get back. We have waited a long time for a squadron of interceptor fighters to be located in our defence ring. The expected day has now come, and citizens may sleep sounder in their beds for the knowledge. The "Fury" could be in no better hands than those of Squadron-Leader Slatter and the pilots of No. 43 (Fighter) Squadron. We have met them, and photographs in our issue of September 19, 1930, show to what a pitch of perfection a fighter squadron can be trained.

I.L.I.S.

The Stockholm International Aero Show
May 15-31, 1931



I.L.I.S.: On the left, an artist's idea of how the Stockholm Aero Show will appear from the air. On the right, a sketch plan of I.L.I.S. The tent hangars O, P, Q, R, S, T, U, are reserved for machines which are to be demonstrated during the Show.

UNDER the patronage of H.R.H. the Crown Prince of Sweden, an international aero exhibition will be opened in Stockholm to-day, May 15, and will remain open until the end of the month. It may be recollected that this exhibition had been planned for the period September 6-28 last year, but had to be postponed until this year. The exact reason for the postponement was something of a mystery, the exhibition authorities giving as the explanation that the buildings could not be finished in time, while others claimed that lack of exhibitors was the cause. However that may be, the show *was* postponed, and is taking place this year.

The I.L.I.S., as the exhibition is called from the initial letters of its Swedish title, *Internationella Luftfartsutställningen i Stockholm*, is planned on orthodox lines as regards the exhibition material, i.e., aircraft, aero engines, instruments, equipment and accessories, plus historical, statistical and other material. In other respects, however, it will differ a good deal from previous exhibitions of this nature. It may be said that the Stockholm Aero Show will consist of two parts, a "stationary" exhibition, which is of the usual aero show character, and the "mobile" section, which takes the form of tent hangars in which exhibitors can house machines intended to be taken out and demonstrated during the exhibition. This applies more particularly to seaplanes, as the land space adjoining the exhibition is too small to permit of landplanes taking off from and alighting on it. Firms who wish to demonstrate their landplanes will have to keep them at the Stockholm Air Port, some distance away.

The general plan of the exhibition is indicated on the accompanying two sketch plans, from which it will be seen that there is a main exhibition building flanked by tent hangars. The latter will be used for demonstration machines only, while the "stationary" exhibits will be housed in the larger building, on the stands A to N.

We are informed by the exhibition authorities that aviation material will be exhibited by France, England, Italy, Holland, Germany, Czecho-Slovakia, and Norway, in addition, of course, to the Swedish exhibits, which will doubtless form a large proportion.

Aerial Photographs for Irish Free State Publicity

The possibility of aerial photographs for advertising the country was discussed recently by the Executive Committee of the Irish Tourist Association, Dublin. The demand for photographs has increased largely within the last two years, and if the present negotiations are successful a booklet will be issued for next year containing aerial views of a number of Irish beauty spots. It is not known

England's share in the Stockholm Aero Show will, as we pointed out in FLIGHT last week, be relatively small, due very largely to the holding of the Buenos Aires exhibition recently, upon which the energies of the British aircraft industry were concentrated. The importance of the Stockholm show should not, however, be overlooked, and in this connection we would remind the industry of Lord Amulree's remarks at the A.I.D. Annual Dinner, recorded in last week's issue of FLIGHT. A small nation is always at a disadvantage when it comes to holding exhibitions, and no one will expect the I.L.I.S. to equal in size or importance such old-established and world-famous shows as those in Paris, for instance. But there is little doubt that thousands interested in flying will visit Stockholm from the Scandinavian countries, the Balkan States, etc., and thus there should be a very good opportunity to demonstrate machines at the Stockholm Air Port. This applies, perhaps, particularly to machines of the light 'plane class, and we must admit we are a good deal disappointed to find that not only will there not be a single British light aeroplane shown in the exhibition building, but, as far as we can gather, very few of the light 'plane firms are contemplating sending machines over for demonstration purposes. We have not yet received a list of exhibitors, but we shall be surprised if Germany, for example, does not take the opportunity of making a good show with light aeroplanes and seaplanes. It seems a pity if foreign countries should be well represented and Great Britain, whose light aircraft are the finest in the world, should be entirely absent. There is still time to send machines to the Stockholm Air Port if not to the exhibition itself, and a collective "circus" of British light 'planes could still be got together for the purpose of paying a visit. A "flotilla," consisting of one each of the well-known types of British light 'planes, such as Avian, Bluebird, Civilian Coupé, Desoutter, Comper Swift, Cierva Autogiro, Moth, Hendy 302, Parnall Elf, Redwing and Spartan, would be a welcome sight in the sky above Stockholm. Many of these types are available as seaplanes, a type which should be particularly suitable for Scandinavian conditions.

whether the photographic work will be done by the Army Air Corps, which has done a considerable amount of work for the Archaeological Research Commission with excellent results, or a commercial organisation. The possibility of this type of publicity was discussed some time ago in Ireland, and, although a film was made for advertising an Irish factory, with some aerial views, no definite company was formed for exploiting this form of publicity.

AIRPORT NEWS

HESTON

SATURDAY afternoon at Heston was, as is usual on a fine day, a scene of much animation, with some 40 aircraft on the Aerodrome.

Particular interest was engendered on this occasion since everyone was awaiting the arrival of a contingent from the Düsseldorf Aero Club. Herr Dominicus was the senior member of the party which arrived shortly after 6 o'clock. Five machines arrived at that time, including two B.F.W. (Siemens), one Klemm (Siemens), one Raab-Katzenstein (Siemens), and one Junkers (Junkers).

Commdr. Perrin, Secretary of the Aero Club of Great Britain, together with members of the Committee, welcomed the party at Heston on their arrival. Later on in the evening Herr Kirsch, who had had some plug trouble, also arrived in another Klemm. Herr Kirsch is very well known in this country, as he spent some months over here last year helping to demonstrate Klemms.

In the evening the Aero Club gave a Dinner to the visitors at the Savoy Hotel.

MR. MERVYN O'GORMAN, as Chairman, made a speech of welcome, and said that they were doing what little they could as some return for the exceptional hospitality which English flying visitors had always been shown when they went to Germany. Such visits, he said, did a great deal to further cordial international relationships, the fostering of which should be one of the main objects of flying.

MR. DOWNES-SHAW, the Chairman of the Bristol and Wessex Aeroplane Club, seconded in a carefully-chosen speech in German.

HERR DOMINICUS returned thanks on behalf of the visitors, speaking in exceptionally good English, and he

said how pleased they all were to have the opportunity of making this flight.

Sqd.-LDR. THE HON. F. E. GUEST made a short speech of farewell to the visitors, as they all had, unfortunately, to leave Heston the following day. He was entertaining when he described some of his experiences during trips he himself had made to Germany, and particularly when he aired the few German words he said he had been able to learn.

LADY BAILEY seconded this farewell charmingly, and also stressed the wonderful hospitality which had been her lot when flying in Germany, and expressed a hope that when the members of the Düsseldorf Aero Club came over again, as she was sure they would, they would bring some ladies with them.

HERR VON WINTERFELD also spoke in excellent English, although he said that this was the first time he had ever been in England and the first time that he had spoken in English. He stressed the sporting attitude of aviators in general and extended a hearty invitation to English aviators to attend the meeting which was to be held at Düsseldorf towards the end of June next.

Visits such as these do a very great deal to cement the cordial relationship which already exists between private owners and club members of other countries, and it is to be hoped that they will be more frequent in the future. It was very unfortunate that the party had to leave for Germany again so soon, and also that their visit did not coincide with one of our flying meetings. Let us hope that they will be able to organise another such visit at a later date.



The ten German visitors from Dusseldorf Aero Club on their arrival at Heston. Miss Spooner, who is with them, led them, in Mr. Lindsay Everard's "Puss-Moth," from Lympe. (FLIGHT Photo.)

To British Aviators passing through Tunis

WE are indebted to Shell-Mex, Ltd., for the following information regarding a notice issued by H.M. Consul-General at Tunis in respect of precautions which should be taken by British aviators landing in that area:—

His Majesty's Consul-General at Tunis desires to bring to the notice of British aviators landing at Tunis the following:—The Tunis Aeroport at Kheredine is, during working hours, in constant touch by wireless with the aviation ground at Tripoli, and advises that station of the departure of all planes from Tunis to Tripoli direct, so that they may take such steps as may be possible to search for and assist aviators who fail to arrive there in a reasonable

time, and warn Tunisian authorities on this side of the frontier. It is therefore particularly advisable that air-men who, when flying to Tripoli, are obliged, by atmospheric conditions or for other reasons, to alight at intervening places in Tunisia, should, as soon as possible on reaching the nearest telegraph or telephone station, notify the Airport at Tunis (Aerodrome Hydro de Tunis-Carthage; 'phone, "Tunis No. 29.74"; telegraphic address, "Navirienne, Tunis") of their position, which will enable the authorities to advise Tripoli accordingly, and to take steps for their assistance in case of need. There are aerodromes at Bou Ficha, Kairouan, Gabes and Ben Gardane, the frontier post.

SAFER AND MORE SERIOUS FLYING

THE increase in private and commercial aviation already calls for readjustments in the standards and conduct of flying. In the first place, owners of private aircraft are flying about the country with very few hours' experience to their credit, and, provided their engine does not fail and the weather is good, seem to get along well enough. On the other hand, should they encounter engine failure or bad weather, they may easily get into trouble through lack of experience.

Another point to be considered is that the increase in the number of aircraft in certain areas round London has already led to the overcrowding of the air, a state of affairs that is not assisted by young pilots either ignoring or not following out to the letter the rules of the air in the vicinity of their own aerodromes and when making flights along the main airways. In other words, the general impression is that a lot of private flying is too casual.

As regards professional pilots, it should be pointed out that there is nothing to prevent a man holding a B (professional) licence from becoming an instructor, and, if he is prepared to forgo financial gain, he can even become an instructor when holding an A (private pilot's) licence. In other words, the holding of an A or B licence is no real guarantee of a pilot's suitability for the job. It is true, on the other hand, that most of the commercial air line pilots and instructors at the various flying schools are thoroughly experienced men, but the time will come when there will be the need for more of them. Further, the present-day pilot or instructor may wish to bring his flying up to date, for nothing makes a man so stodgy as

continually flying the same machine over the same course. With these considerations in view, the formation of an International Flying Training School, not only for military but also for private owners and commercial pilots, seems to be most opportune. This School, whose land and sea training bases are situated at Hamble, near Southampton, intends to provide the best possible instruction in the art of flying. From the private owner's point of view, there is all the difference in the world between flying accurately and flying carelessly, and in knowing what to do in an emergency instead of having to trust to luck. All these points will be taught at the new Air Service Training School, and should be of the greatest value to the young pilot.

Professional pilots will also find they have much to learn at this School. First and foremost, there is what is called the Blind Flying School, by means of which pilots are taught to fly by following their instruments instead of by sighting the horizon or the ground. It is considered that proficiency in blind flying will be of enormous value when flying in fogs and at night, and will overcome the present practice of pilots hugging the earth where bad visibility prevents them climbing higher. Other important branches of this new training deal with Navigation and Air Law generally, while, in addition to the actual flying, ground work dealing with the care and maintenance of the aircraft and engine is an important feature.

By these means it is hoped to establish a very high standard of flying, and at the same time inculcate into young pilots a proper sense of their responsibilities.

BOOK REVIEWS

"AN HOUR OF AVIATION"

CAPT. NORMAN MACMILLAN has added yet another valuable volume to those he has already published on flying. Quite why he calls it "An Hour of Aviation" is difficult to understand, since even the most voracious reader could hardly consume his book in that time. Superficially, one would be tempted to think that he has attempted too much and got nowhere as a consequence, since his fifteen chapters are each about different subjects, and between them cover almost every phase of aviation. A single chapter does not offer a very great deal of scope in which to treat a subject such as, for instance: "The flying of aeroplanes"; or Air Survey, or, in fact, any of his other subjects, but, in spite of that, he has been able to give his readers a very sound though necessarily rudimentary knowledge of each particular subject.

In his first book, "The Art of Flying," and, indeed, in his next one, "Into the Blue," Capt. Macmillan showed that he was a master of words, but in his "The Air Travellers' Guide to Europe," he really let himself down rather badly. This fourth volume, however, entirely retrieves his position and places him once more at the head of our literary flying men. He does not, of course, go very deeply into the technical side with his various—what might almost be called essays—and when he does, he leavens it by the use of words which leave the reader in admiration of his powers of description. The following passage, for example, is surely a gem of its kind, and shows a mastery of the language which is seldom found among flying people:—"There is no grander sight in the air than that at seven thousand to eight thousand feet, when hail is forming above the earth. Big clouds lour black around one. A steep wall rises upward from a sea of tinted grey to a ceiling of translucent pearl. Suddenly, against the almost black wall there is a slash of streaming white. It grows from nothing out of the pearl above and falls slanting across one's closing vision. For fifteen hundred feet, it drops its curtain o'er the gloomy stage. No sun is visible in all the solemn air. The atmosphere is cathedral. Since, with the noise of engine no further sound is audible, the eyes must take upon themselves the duty of the other senses. And in one's ears one seems to hear, as though it were just all around, hissing upon the vaulting roof and wall, and close of the cathedral of the clouds, the beating of the hailstorm. It is a sight which audibility would reft of more than half its splendour." It must not be thought, however, that Capt. Macmillan overdoes his powers of rhetoric, for he certainly does not, and his straightforward descriptions are such that the veriest tyro in aviation cannot but understand them.

I recommend the book as an admirable one for those who, as yet, know little about aviation, and wish to gain in one volume as wide a knowledge as they can, be they young or old.

"DAEDALUS."

"An Hour of Aviation." By Capt. Norman Macmillan, M.C., A.F.C. (Duckworth). Obtainable from FLIGHT Offices. Price 3s. 9d. post free.

A VALUABLE BOOK

MAJOR OLIVER STEWART'S new book, entitled "Flying as a Career," fills a want which has been particularly noticeable to those of us who are constantly getting letters in which the writer wishes to know a hundred and one details as to how he may enter the aviation world, and, as he hopes, make his fortune. From this point of view, if for nothing else, we owe Major Stewart a very sincere debt of gratitude, since his book will answer these questions far better than it is possible to do in a letter.

In quite a small space he has covered all the ground which it is necessary to do, and there is practically nothing in the book which one could truthfully say is redundant. One part of it, however, we frankly cannot understand, and that is his selection of photographs. Not only does he use several of American machines, but a large number of them are Service aircraft, and very few of them appear apposite to the text which is near them. For example, facing page 74, which is the beginning of the chapter on aviation for women, we find a full-page photograph of the Vickers Victoria Troop Carrier. Possibly Major Stewart was thinking of the likelihood of the Victoria being used for rescuing the female part of the population of a beleaguered city such as took place in the not far-distant past.

Apart from these photographs, however, the arrangement of the book is admirable, and the facts appear accurate. Everyone, especially the younger generation who are trying to strike out for themselves and who wish to know what opportunities the aviation world offers, should obtain a copy.

One avenue Major Stewart does not describe, and that is, his own particular job of Aviation Correspondent. Perhaps he omits to do so through modesty, but there is no doubt that a growing number of people are at least earning their bread, if not their butter as well, in this kind of work.

"DAEDALUS."

"Flying as a Career." By Major Oliver Stewart (Sir Isaac Pitman & Sons, Ltd.). Obtained from FLIGHT Offices. Price 3s. 10d., post free.

PRIVATE FLYING & CLUB NEWS

SHOREHAM BY SEA

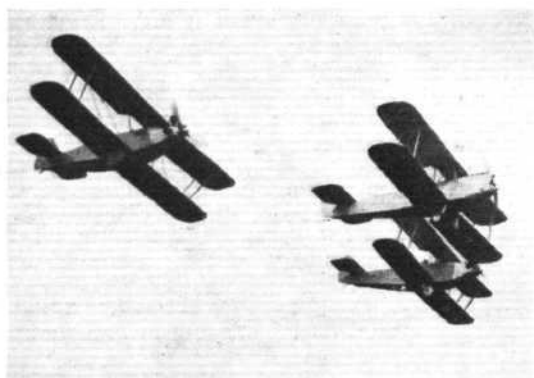
A Potential Holiday Resort for all Aviators, which is to be the Municipal Airport of Brighton, Hove and Worthing

SHOREHAM.—As we remarked last week, the weather treated the Southern Aero Club very badly indeed last Sunday week—especially in view of the fact that one of the principal claims of Shoreham as an aerodrome is the infrequency of bad weather. It is always the way, however, when one wants to "show off," and it was particularly ironical of fate to send bad weather when the S.Ae.C. wished to celebrate the final touches to the negotiations for the establishment of the joint Municipal Aerodrome at Shoreham.

However, last Saturday made up for it, and we had the pleasure of a second invitation to attend the postponed function—and very successful and enjoyable it was. As we have remarked before, Shoreham is admirably suited for a Municipal Aerodrome, and the joint scheme of Shoreham, Brighton, Hove and Worthing with this end in view—which, we understand, now only awaits the ratification of the Worthing Council—should meet with every success.

As previously stated, its situation and the facilities provided are unique, for it is bounded on the north and south by main roads providing frequent 'bus services between Brighton and Worthing, while at the southern boundary also there is the railway, with a station on the aerodrome itself. Furthermore, on the eastern side is the river, where seaplane possibilities must not be overlooked, while on the western side is another road, communicating with London and the north.

The site—which is the old aerodrome of Lees' Barn—is also excellent from the flying point of view, being large, with a good surface. When, therefore, provided with hangars, a large clubhouse, restaurant, and other facilities, there is no reason why it should not form the most important airport in the south of England, not only from the point of view of commercial flying—for it is on the direct



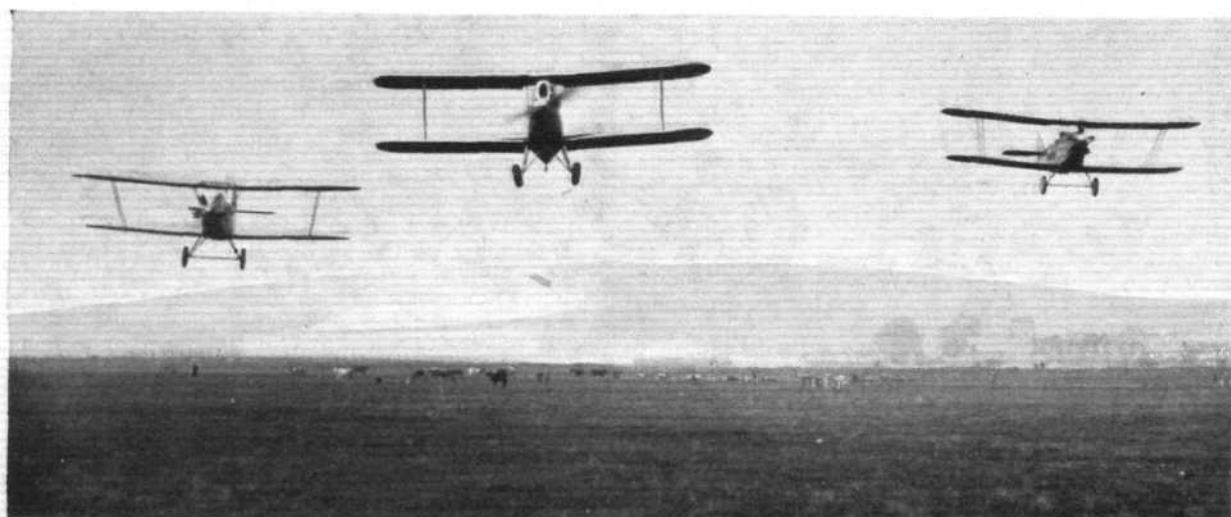
route from London to the Continent—but for the private owner and sporting side as well.

However, to return to Saturday's happenings, first, we were informed "the second luncheon is now served," and after which informal, but enjoyable, affair was over, one or two short speeches were made. Mr. G. A. Wingfield gave us a brief, but amusing, account of his early associations with Shoreham, when he formed a flying club there round about 1909. He also hinted that, in the event of the Municipal scheme falling through, he would like to

enter the field once again. Mr. F. G. Miles and Mr. C. L. Pashley—who also is an old Shorehamite—also said a few hopeful words regarding the future of the scheme. Then someone spoke on behalf of the visitors, thanking the S.Ae.C. for having them down twice within a week, while, in response, Miss Birkett—the Club's energetic secretary—thanked the visitors for troubling to *come* twice!

We then adjourned to the aerodrome, where some really enjoyable flying was witnessed during the rest of the afternoon. Already a considerable number of machines had arrived at the aerodrome. During the early stages we noted round about 30, of which ten were "Moths," four "Puss Moths," four "Avians," while other types included Desoutter, a D.H.50 (EAAC), a "Bluebird" (AATO), C. Napier's "Widgeon" (AADE), a Saro "Cutty Sark," the Alexander Duckham "Spartan" (AAMB), and an "Autogiro." The latter was piloted by Flt.-Lt. H. M. Schofield, who gave a demonstration of "hovering over the aerodrome," somewhat different to that described by Mr. Wingfield with reference to the first aeroplane to visit Shoreham. Flying actually commenced with a sort of "fly-past" of the various machines. Then F./O. Leech—who had flown over in a Service Avro Lynx—gave a magnificent display of aerobatics on the new metal "Martlet," which was briefly described in our last issue. This little machine is truly wonderful, and in Leech's hands it put up a performance we will not forget for some time.

A little later, Mr. Miles, on the same machine, Leech on the "Martlet (Genet-Major)," and F./O. S. A. Thorn on another "Martlet (Genet)," gave us some formation flying on these excellent little 'buses. It was a thrilling display



"FORMARTING": Three of the S.A.C. "Martlets" put up some excellent formation flying at Shoreham on Saturday last, as shown on the two pictures on this page. The leading machine is the metal job, with Mr. Miles up, and on the left of the picture is the "Genet-Major" model, piloted by F/O. Leech, and on the right the "Genet II" model, piloted by F/O. Thorn. (FLIGHT Photos.)

AT SHOREHAM: On the left we show old and new Shoreham, in Mr. C. L. Pashley (right)—who was associated with this aerodrome in the very early days of flying and must now be not very far short of the 10,000-hours flying mark—and Mr. F. G. Miles, Managing Director of Southern Aircraft, a more recent "settler" at Shoreham. On the right we show the Mayor and Mayoress of Worthing standing beside the Metal "Martlet." (FLIGHT Photos.)



and at times they flew quite close, in approved R.A.F. style.

Another fine display by Leech on the metal "Martlet," and sundry exhibitions by some of the flying visitors, completed the programme—of course, all this time C. L. Pashley was up and down with clockwork regularity, taking passengers in the good old Avro. Finally, it should be mentioned that there was a fairly large crowd of spectators and a number of notabilities, local and otherwise, present, including representatives of the Muni-

cipalities concerned in the scheme.

Altogether, it was a most enjoyable afternoon, and we look forward to seeing some good flying meetings at Shoreham-by-Sea in the near future, when under municipal management it will no doubt be more widely advertised.

THE READING Aero Club.—On Saturday, May 16, the Reading Aero Club will be inaugurated, and the new clubhouse officially opened by Col. Sheldermine. The Earl of Northesk, the President of the club, will, together with Lady Northesk, be acting as host on this occasion. The actual opening is timed for 3.30 p.m., and visitors are therefore asked to arrive by 3 o'clock at the latest.

From 4.30 to 6 p.m. there will be tea and dancing in the clubhouse, while at 5 o'clock the ladies' race will start. This will be run off in heats on a triangular course around Woodley, Wokingham and Twyford. The heats will be one circuit and the final will be two circuits. For this race Lord Northesk has given a challenge cup, a replica of which will be presented to the winner. Entries have been received from many well-known lady pilots, including Miss Winifred Spooner and Miss Amy Johnson.

At about 5.30 p.m. F./O. H. H. Leech, who put up such a magnificent aerobatic display at Shoreham last week, will, it is hoped, repeat his performance.

As a final attraction it is hoped that Capt. Hawks will be able to come over in his high-speed "Travel Air" monoplane.

Passenger flights will, of course, be available during the whole afternoon.

PHILLIPS & POWIS, LTD.—The Phillips & Powis School has been able to put in quite a lot of flying for the month of April, despite serious interference by bad weather, the actual total being 173 hrs.

Other activities included a lecture, as has already been announced in FLIGHT, by Capt. Lloyd Taylor, given at the Town Hall, on the subject of the "Air Route to India." Flt.-Lt. R. L. Bateman, the Chief Instructor, also spoke before the Rotary Club, and raised a considerable amount of interest. During the week two of their ground staff, Messrs. Cockburn and Clarke, have also passed their "A" licence tests.

NOTTINGHAM Flying Club.—The Nottingham Flying Club will be holding a pageant on Sunday, May 24 (Whit-Sunday), when all aerial visitors will be made welcome and entertained by the club.

During the past week quite a large number of visitors have stopped for a while at Tollerton Aerodrome, including Flt.-Lt. Schofield, who is now a free lance pilot, and has recently been seen flying an Autogiro.

On Wednesday, May 6, Aerofilms, Ltd., used the Aerodrome as a base from which to carry out a photographic contract for Lincoln.

The total flying time for the week-end, May 7, was 26 hrs.

BROOKLANDS.—Brooklands Aero Club is certainly profiting by the expansion of Brooklands Aviation, Ltd., and it is seldom that one can now go down to the track without seeing a great deal of aerial activity.

Sunday last was no exception, and, quite apart from club members receiving instruction, there were several machines hard at work joy-riding. The new club premises and hangar accommodation must be some of the most spacious in the country. We imagine that the members must now feel somewhat lost.

The swimming pool, another of the new amenities, is nearly complete, while the new Club House also has a full-sized billiard table.

On Saturday, June 6, as has already been announced, the Brooklands Air Display will be held. Readers should take particular notice that on page xxix they will find a coupon, and, by detaching this and presenting it at the gate on that day, will save 1s. on their entrance fee, thus obtaining admission for 1s. 6d. instead of the 2s. 6d. charged to those who do not read FLIGHT. This coupon will also be included in FLIGHT for May 22, 29 and June 5. Further details of the attractive programme will be published later.

Last Friday and Saturday will long remain in the memory of flying people at Brooklands as one of the occasions when airmen taught the motor trade something. The occasion was the Double Twelve hours race, wherein the team of M.G. Midgets swept the board, and the first one, piloted by the Earl of March and Mr. C. S. Staniland, secured the premier awards.

The Earl of March, the entrant of the winning car, is a fairly new-comer to aviation, and a member of Hanworth Club. He took his "A" licence last year. Mr. C. S. Staniland, his second driver, is a test pilot of the Fairey Aviation Co., and has so often put up magnificent displays on the Fairey "Firefly."

A victory such as this, wherein the M.G. Midget was driven by two aircraft pilots, is yet another step towards linking up motor car and aircraft interests. We already have two or three large motor car agents running aviation departments, and it is freely anticipated that one or other of the motor car firms will be producing aircraft engines, if not complete aircraft, in the near future.

Apart from this, however, there is the undoubted fact that people who fly cannot well be without a car in which to get to and from their Aerodrome. This fact naturally puts many people off flying, since both cars and aeroplanes are comparatively expensive articles, and, moreover, the man who flies finds it difficult to be content

with a cheap car of poor performance. Things are, however, greatly changed when such a car as the M.G. Midget is available, for here at a very low price indeed, one can have a car which holds its own with almost everything on the road. It has already built up an enviable reputation for itself, and the race on Friday and Saturday greatly enhanced this. It showed, in fact, that the tiny car of low price has advanced in efficiency, speed and endurance to a degree which even those with a thorough knowledge of racing cars did not realise.

There is something peculiarly attractive to people who



The Earl of March (left) and Flt.-Lt. C. S. Staniland, after their momentous victory.

fly, about small cars like this, and there is certainly more thrill to be got out of driving a car which, although of such small size, has an engine with really exceptional acceleration, has good brakes and is extremely nippy.

There are, of course, several cars of about the same class built in standard forms, but as a Sports model the M.G. Midget is supreme. The M.G. Car Co., at Abingdon-on-Thames, which started only five years ago as a small garage in an Oxford back street, has now assumed very large proportions, and is to be reckoned as one of the leading Sports car factories in the country.



THE GLIDING SHOW

An Interesting Exhibition of Gliders and Stands of the various Gliding Clubs at the Royal Agricultural Hall, Islington. No one with gliding at heart should miss this

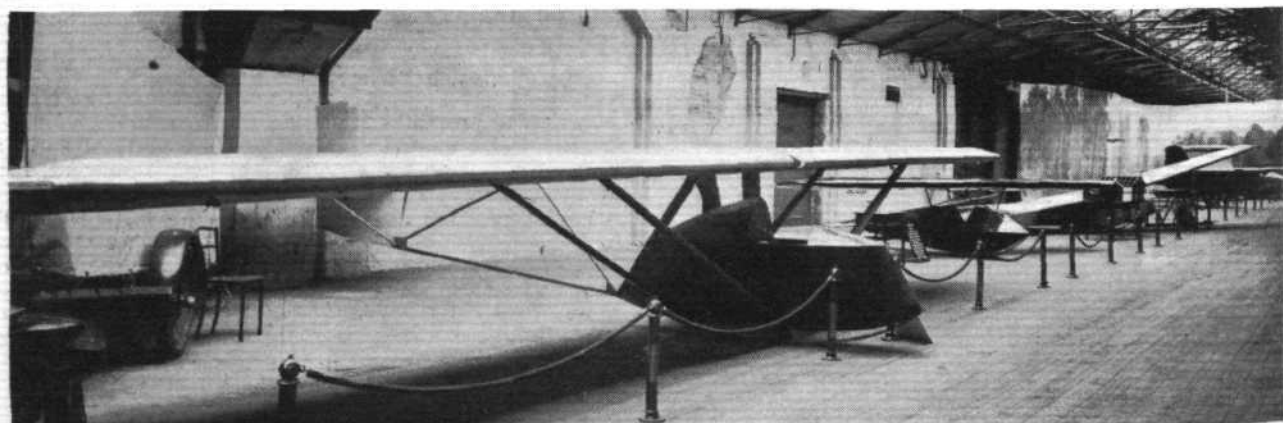
THE GLIDING EXHIBITION.—Now that the Gliding Exhibition in the Gallery of the Used Motor Show at the Royal Agricultural Hall is properly arranged, we are able to give a few more particulars of it, for those who are unfortunate enough not to be able to attend.

This is an exhibition which everyone who is interested in gliding—and the number is already very great—should make every effort to see.

There are several representative types of gliders, such as the "Scud" shown by E. D. Abbott, Ltd.; the "Albatross," designed by Capt. Latimer Needham long before the present vogue of building highly efficient gliders over here had taken hold; the "Hols-der-Teufel," a German machine which is capable of soaring, but except for the faired in nacelle-like fuselage, is practically a Zögling, in fact, the tail part of the fuselage structure looks very flimsy and not at all suitable for hard work usually given Zöglings. This, we understand, has been built by Mr. Hiscox, of the London Gliding Club, together

with some of his co-members, from drawings obtained from Germany. Finally, there are two examples of gliders from that prolific designer, Mr. Lowe-Wylde, whose factory, the British Aircraft Co., at Maidstone, has already turned out so many different types. Those shown are the B.A.C. II, which is a superior type of Zögling belonging to the North Kent Gliding Club, and the B.A.C. VI, which is so well known as one of the machines upon which Mr. Lowe-Wylde has given such a large number of demonstrations of auto-towed gliding.

The range of Stands is also quite comprehensive, and, starting from the far end, we find a space devoted to Caravans built by Rice Caravans, Ltd., of Skipton, Yorks. Theirs is a folding type of caravan particularly suitable for towing behind a small car, and which should be of great use to those interested in gliding and who wish to camp out during week-ends. Mr. Rice is well known in Northern gliding circles, and is a keen glider pilot. Next comes a Stand devoted to an exhibition of parts of the Dickson glider, which are being shown by Selfridge's



A view down the gallery at the Agricultural Hall. The gliders from left to right are the Hols-der-Teufel, the Scud, the Albatross, and the B.A.C. VI. Between this last and the Albatross is one of the Rice folding caravans. (FLIGHT Photo.)



The Gliding Stands at the Show. The names on the stands are self explanatory and show that from the big multiple stores and large timber construction works down to the gliding clubs themselves, everyone is taking an interest in gliding. (FLIGHT Photo.)

Aviation Department. Then the British Aircraft Company have their own Stand, with examples of their work and a large range of photographs showing their gliders. Selfridge's Aviation Department's own Stand comes next, and chiefly seems to be furnished with propaganda for Imperial Airways; they have, however, an excellent assortment of aeronautical literature, together with photographs of every conceivable phase of aviation. The British Gliding Association come next, with their Secretary, Mr. Waplington, in charge, and here, very naturally, the visitor can get accurate information on anything to do with gliding. The next is a new-comer to aviation in the person of G. Ellis & Co., of Hackney Wick, London, E.9. This firm specialises in hangars for aircraft, pavilions, and small garages. One of their first hangars is a 50-ft. by 30-ft. timber-built portable one, which was supplied to the London Gliding Club in sections. It speaks well for their workmanship, in that the club members did not have the slightest difficulty in putting together a building of this size, and thereby obtaining a hangar at remarkably low cost. One interesting feature of the Ellis type hangar is that the purlin roof is built up with its 7-in. by 2½-in. principals resting on 5-in. by 3-in. posts, so that the roof stresses are taken on these posts instead of, as is usual with portable buildings, direct on to the wall sections. This means that, when necessary, one complete set of wall sections may be taken down without in any way affecting the roof. A new complete roof may then be erected alongside, and the wall erected again on the outside thus allows for expansion in a very cheap manner. Those who are interested in obtaining hangars of such a class and of such excellent workmanship at a low price would be well advised to investigate the claims of this company. E. D. Abbott, Ltd., of Farnham, have the next Stand, and Mr. L. E. Baynes, the designer of the "Scud," is in attendance. This little machine has already been described extensively in FLIGHT for February 6, 1931, and constitutes the first British-designed and British-built glider, which is an excellent soaring machine without being large and cumbersome. Its unique design makes it exceptionally handy for a small club, and its robust construction should insure it a long life. The London Gliding Club, the Sailplane and the North Kent Gliding Club have the last three Stands, and their general layout should attract a large number of visitors. By the time this appears in print the last day of the Show will be in sight, but if the present number of visitors continues to go there, many thousands will have been converted to gliding by the time this is read. Those who, however, have not been to see this Show should certainly do so, even if they cannot yet see their way to joining a Gliding Club. We understand that quite a lot of business has already been done both in selling gliders of the types which are exhibited and obtaining new club members.

THE SOUTHDOWN SKYSAILING CLUB.—The Southdown Skysailing Club had a full day's gliding on Sunday, May 10, but owing to light winds only short flights were possible. Some thirty-five launches were made, and most of the active flying members made up for lack of practice due to the bad weather during the last six weeks or so.

The useful but uneventful series of flights were continued up till 8.50 p.m.

We are glad to inform those interested that the Club has now settled down at Ditchling Beacon and will be gliding there as usual every Sunday.

A NEW GLIDING RECORD.—Herr Grönhoff set up a new distance record on Tuesday, May 5, when he flew from München to Kaaden, in Bohemia, a distance of 166 miles. He apparently gained his height in the first place by means of a tow from a power-driven aircraft.

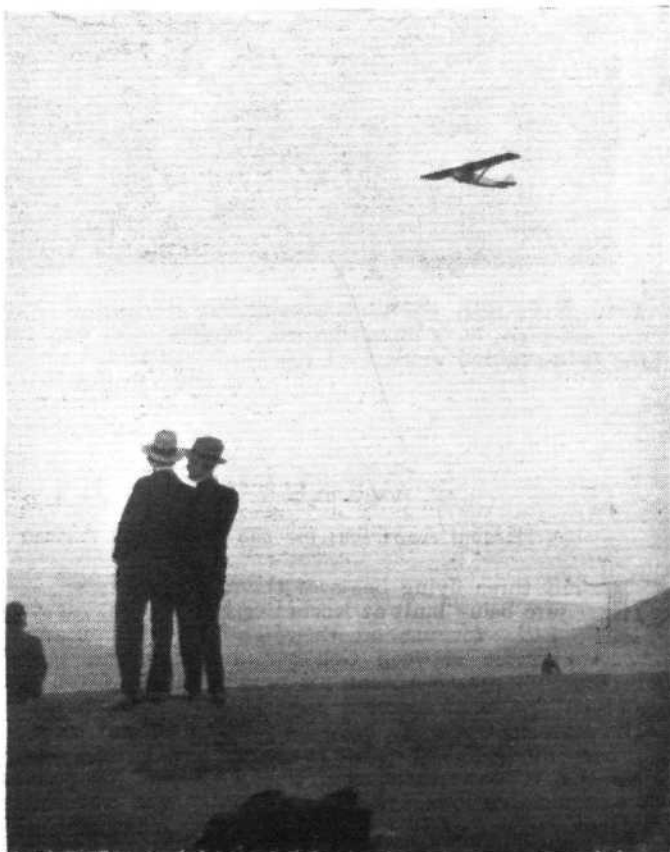
About the same time Herr Henschel took off in the usual method from a hill, and remained in the air for 11 hr. 1 min., reaching a maximum altitude of 3,300 ft.

CHRISTENED WITH AIR.—An unusual christening ceremony was carried out at Heidelberg during the week ending May 9, when the Rector of the Heidelberg Academy, in naming a new sailplane belonging to the Heidelberg Academic Aviation Union, poured a glass of liquid air over the fuselage.

This is probably the first instance of a christening of this kind.

GLIDING IN WALES.—The novelty of gliding and soaring attracts large crowds to the Brecon Beacons for the displays arranged by the Merthyr Gliding Club.

The club was founded early last year. It was started by a few enthusiasts who wasted no time in securing a machine of the R.F.D. design, and steady progress has since been made.



A London Gliding Club Pruffing soaring over the Club's ground at Totternhoe near Dunstable. Such scenery as this is the common lot of the gliding enthusiast, as the sport takes him to the hills and not the flat uninteresting plains.

AIR TRANSPORT

THE AFRICAN AIR SERVICE

THE following details concerning the air service between England and South Africa have been made public by Mr. H. W. Sampson, the Union Minister of Posts and Telegraphs:—

"The Union Government, together with the Governments of all the other countries on the route, have undertaken a share of the total subsidy liability (approximately £940,000) in connection with the service.

"The proportion which the Union Government have agreed to pay to the United Kingdom is £400,000, spread over five years in decreasing amounts: First year of through service, £120,000; second year of through service, £100,000; third year of through service, £80,000; fourth year of through service, £60,000; fifth year of through service, £40,000.

"As regards the carriage of mails, the agreement provides that the rates to be paid shall be arranged between His Majesty's Postmaster-General in the United Kingdom and the company, with the following maxima:—

"Between London and Khartoum, 12s. 6d. per pound; between London and Uganda, Kenya or Tanganyika,

17s. 6d. per pound; between London and Northern Rhodesia, Southern Rhodesia, 25s. per pound. The air mail surcharge (over the ordinary letter charge) between the Union and Great Britain will be 10d. per half-ounce.

"Within the Union, hangars will be provided at Johannesburg and Capetown, wireless stations at Germiston, Victoria West and Capetown, meteorological stations at Germiston, Kimberley, Victoria West, Touws River, Triangle, Ceres and Capetown.

"In addition the meteorological services in the Union will be co-ordinated and be available to all aircraft for night flying, beacons and special floodlighting apparatus will be installed at Johannesburg, Kimberley and Capetown.

Landing and housing fees will be paid directly by the company to the Governments concerned, excepting that within the Union all fees will be paid direct to the municipalities who, under separate agreement with the Government, have provided aerodromes, hangars, and other facilities, and have been licensed under the Aviation Act to accommodate all types of aircraft."



THE VICKERS SINGLE-ENGINED "VIASTRA": This machine has now been produced, according to the original plan, as a three-engined, twin-engined, and single-engined monoplane. West Australian Airways are using the twin-engined version on the Perth-Adelaide route. The single-engined type here shown landing at Brooklands is fitted with a Bristol "Jupiter" Series XI F.

WIRELESS ON THE AIR ROUTES

Marconi Apparatus for the Indian and African Services. Its Use on the Princes' Machines in Chile

THE three flying boats of the "Kent" type which are being built at Rochester for Imperial Airways, Ltd., for use on their Trans-Mediterranean air service between Genoa and Alexandria, serving both the Indian and African air routes, will be fitted with the latest design of Marconi apparatus.

The Marconi Company have been commissioned to equip the new flying boats with their Type A.D.18a. aircraft apparatus, a powerful installation with an independent drive, which ensures great constancy of the transmitted wavelength. A highly sensitive receiver incorporating a screened grid valve will be used, and it is estimated that the flying boats will have a wireless range of up to 500 miles.

Power for the A.D.18a. installation is supplied by a wind-driven generator operating in the slipstream of the propellers, and, in order to provide for the possibility of operating the wireless apparatus when the flying boat has descended on the water, arrangements have been made by

which the wireless generator can be driven by the aircraft gas starter engine. A light mast is carried to support the aerial when the aircraft is at rest, but under normal flying conditions a trailing aerial will be used.

The Marconi Company have also received an order from the Blackburn Aeroplane & Motor Co., Ltd., to equip two 10-seater civil aircraft, in course of construction by that company for the Air Ministry, with the well-known Marconi Type A.D.6m. aircraft apparatus, of which a large number is in use in many parts of the world.

As in the case of the Type A.D.18a. installations, the Type A.D.6m. sets are operated by wind-driven generators. To enable the wireless gear to be operated when the aeroplanes are on the ground, hand-driven generators are supplied so that wireless communication can be carried on at any time. Light telescopic masts will also be carried to support the aerial during working from the ground. During flight the normal trailing aerial will be used.

With the Princes in South America

Marconi aircraft gear is being increasingly used, not only on British air routes, but throughout the world. It rendered very useful service during the visit of the Prince of Wales and Prince George to Chili, both the aeroplane and seaplane used for transporting the Prince of Wales during his flights in that country being fitted with Marconi A.D.6. installations similar to those which are the standard fitting for British passenger-carrying aeroplanes.

During the flight of the Princes from Antofagasta the machine was in constant touch with the chain of Chilean aerodrome ground stations; and for the whole of the sector from Ovalle to Santiago, a distance of 220 miles, positions were taken every five minutes by the two wireless direction-finding stations at Quintero and Santiago, the progress of the machine and escort thus being followed and broadcast to an immense crowd awaiting their arrival at El Bosque Aerodrome.

It may be of interest to add that, at the request of Imperial Airways, Mr. T. A. Valette, the Marconi wireless operator and engineer, who accompanied the late Lt.-Commander Glen Kidston from England to Cairo on the first stage of his record-making trip to South Africa, and

who is probably the most expert air wireless operator in the world, accompanied the Prince of Wales in charge of the wireless installation on the "City of Glasgow" during the flight to London.

The Prince of Wales spent most of the time during the flight from Paris, which lasted about three hours, in the cockpit. He was particularly interested in the fact that, by means of the Marconi telephone, the pilot, Captain G. P. Olley, was able to communicate with the ground throughout the flight. The "City of Glasgow" was in direct wireless communication with Croydon ten minutes after leaving Le Bourget, with excellent two-way communication. On account of the poor visibility, Croydon was asked for, and gave several direction-finder bearings after the aircraft had passed over Berck, on the French coast.

On landing in Windsor Park, Captain Olley demonstrated to the Prince that, even when the aircraft was on the ground, he could communicate with Croydon to report their safe landing. Mr. T. A. Valette was afterwards presented to the Prince by Major Brackley, of Imperial Airways.

"Wireless is a wonderful thing," said the Prince, "and I am especially impressed with the use of the telephone on aircraft."

THE AMSTERDAM—BATAVIA SERVICE

SINCE the inauguration of a regular fortnightly air-mail service between Amsterdam and Batavia (Java) by the Royal Dutch Airlines (K.L.M.), 17 flights have so far been executed. The scheduled time for this 9,000-miles route is 12 days, which average has been kept up with admirable regularity. Several flights, favoured by good weather, have been completed in ten days. Evert van Dyk, Kingsford Smith's co-pilot on the first Transatlantic flight from London to New York, made the return flight in nine days, and the ex-Service officer Smirnoff, who was one of the first pilots to fly for K.L.M., broke that record by completing the return trip in eight days. He arrived at Schiphol aerodrome (Amsterdam) on April 24 last.

However, this record did not stand up very long, as the following return flight was done even in a shorter time, viz., seven days, starting on Friday and arriving on Thursday.

This remarkable flight was carried out in a normal service Fokker, equipped with Bristol "Titan" engines, and manned by Messrs. Beekman and Blaak as pilots, mechanic Grosveld and wireless operator Pronk, and carrying 500 lbs. mail.

This flight is an ample proof of what can be done by an energetic crew with an aeroplane possessing excellent flying

qualities and equipped with reliable engines. The fact that the ground organisation on the British aerodromes in India is now much improved has materially contributed to this splendid performance. The following daily stages were covered:—

- May 1.—Batavia—Palembang—Medan, 8 hr. 45 min.
- " 2.—Medan—Alor Star—Rangoon, 10 hr. 5 min.
- " 3.—Rangoon—Calcutta—Allahabad, 13 hr. 5 min.
- " 4.—Allahabad—Jodhpur—Karachi—Jask,
17 hr. 20 min.
- " 5.—Jask—Bushire—Baghdad—Rutbah Wells,
13 h. 45 min.
- " 6.—Rutbah Wells—Cairo—Mersa Matruh—Athens,
14 hr. 10 min.
- " 7.—Athens—Belgrade—Nuernberg—Amsterdam,
15 hr.

Most probably the fortnightly service will be replaced by a weekly one in October next, and the last flights have fully proved that such a service is quite feasible.

The type of Fokker machines used on this air line is built in England under licence by A. V. Roe & Co., Ltd., Manchester, who recently have received orders from Imperial Airways and from the British Indian Government for a number of planes.

The Australian Air Mails

THE first homeward mail which left Darwin on April 27, left Karachi on the ordinary India service on May 6, and reached Croydon on May 12. The second outward mail, which left Croydon on April 25, reached Darwin, piloted by Air Commodore Kingsford Smith, on May 11. The second homeward mail, which starts from Brisbane to-day, May 15, will be operated by Imperial Airways with a D.H. "Hercules," bought from West Australian Airways, as far as Delhi, the pilot of the "City of Cairo" (which crashed at Kupang) being in charge. The first Dutch air mail from Java to Australia left Batavia on May 12.

Long Air-Taxi Flights

MR. FRED DARLING, the racehorse trainer, made a fast air-taxi journey to Dublin and back last week. He engaged a Puss Moth cabin aeroplane of National Flying Services, and was flown in bad weather by Captain Pennington, one of the company's pilots. He spent 2½ hours in Dublin, and was back at Hanworth ten hours after he left there. Another long flight was made on May 11 from London to Kirkwall in the Orkneys. The passengers, a lecturer and his wife, left Hanworth, after an early breakfast, in a Desoutter cabin monoplane of National Flying Services, and arrived at Kirkwall at 1.30 for luncheon. The distance is 570 miles and the train journey to Thurso alone occupies more than 20 hours, after which the crossing to Kirkwall has to be made. The pilot on this flight was Captain J. B. Wilson, one of the company's regular pilots.

South African Diamond Air Service

AMONG the tenders recently invited by the South African Union Government was that of the diamond air service from Alexander Bay to Cape Town. It is stated that the present system of maintaining South African Air Force machines for this work is regarded as too costly. The new scheme is that by private contract the air service should run from Alexander Bay to Cape Town only once a month to convey diamonds from the State diggings to Cape Town; hence the call for tenders by the Secretary for Mines and Industries.

Air Services to Scandinavia

THE K.L.M. (Royal Dutch) and A.B.A. (Swedish) Air Companies have together inaugurated the fastest air link ever yet scheduled between London and Copenhagen, Malmo, this Summer. Instead of taking between nine and ten hours, and stopping at four or five intermediate stations, the new service takes only seven hours from London to Malmo, and the only stop *en route* is Amsterdam, before reaching Copenhagen. This service was inaugurated on May 1, as was another service to Malmo, the Baltic Air Express of the Belgian company, Sabena, which was opened by the Duke and Duchess of Brabant at Antwerp. The Baltic Air Express leaves Croydon at 9.50 a.m., and calling at Antwerp, Düsseldorf, Essen and Hamburg, reaches Copenhagen at 7.5 p.m., and Malmo at 7.45 p.m. Both these services operate daily, including Sundays, and employ the new 16-seater Fokker mono-planes. It is hoped next month to inaugurate a night air mail service between London and Malmo.

THE PRINCE OF WALES AND SOUTH AMERICA



THE PRINCE FLIES TO MANCHESTER: On May 9 the Prince flew in his "Puss Moth" from Hendon to Birmingham, and thence, on May 12, to Manchester. Our picture shows the Lord Mayor of Manchester (centre), presenting Aldermen to H.R.H. the Prince of Wales. On left is Lord Derby, who received the Prince on his arrival at Barton Airport.

I AM very interested in the development of aviation. Although not very apparent at the moment, there is undoubtedly a great future for aviation in South America. The West Coast is served efficiently by Chilean and North American enterprise, but on the Atlantic side little has been done to make use of this form of transport. With the exception of one journey, my brother and I did all our travels in the Argentine by air, and in English machines all the time. From experience I can describe Argentina as one vast aerodrome. There are local difficulties which stand in the way of immediate development, but these could be overcome. It seems to me a real opportunity for the railways, who will be confronted with competition, to anticipate that competition by initiating some

form of air service in co-operation with the railway system."

This was a striking passage in a very striking speech delivered by H.R.H. the Prince of Wales to a great gathering of business men in the Free Trade Hall, Manchester, on Tuesday, May 12. On the day before His Royal Highness was entertained at a banquet by the Birmingham Chamber of Commerce, whom he also addressed. He journeyed from Hendon to Castle Bromwich, and from there to Barton Aerodrome, Manchester, in his own Puss Moth. Prince George accompanied his brother, flying in another aeroplane.

The Princes returned by air to Hendon on the evening of May 12.

AN ATTRACTIVE PROPOSAL

ON Tuesday, May 12, a lunch was held for a gathering of Press Representatives by the Automobile Racing Association. This Association has been formed in order to reclaim some 16 square miles of the north-western shores of the Wash. The scheme embodies grandiose proposals for the formation of a Speedway Track some 15 miles in length; a speed-boat course of the same length; a gliding school and ground; a large aerodrome; tennis courts; bathing pool; boating accommodation; road-racing motor course; two golf courses; football and cricket grounds; bowling greens; Zoological and Botanical gardens; a trotting arena; putting greens; dog and dirt racing tracks; cinema, dance and concert halls; pleasure gardens; hotels and residential areas; the majority of which will all be situated on the reclaimed ground.

Earl Howe was the Chairman who presided at the meeting, and in his speech he outlined the scope of the scheme. Amongst others who spoke were Mr. Devereux, the Managing Director of the parent company, Mr. Palmer, M.P., Col. the Master of Sempill, Lady Bowden, the Earl of March, Col. Shelmerdine, and Major Paulet.

As it stands, there is no doubt that, if properly carried through, it will provide England with a site upon which it should be possible to centre the speed attempts of the world, both in the air as well as upon land and water.

Every other country has its own roadway track and a well-organised speedway course. Apart from the Pendine Sands, however, England is dependent upon Brooklands for such attempts, and, as is well known, Brooklands has already become inadequate for present-day motor-car speeds. Such a scheme as is suggested by the Automobile Racing Association should undoubtedly foster very great

interest in speed records and attract a large number of the racing enthusiasts of the world. As was pointed out by several of the speakers, the site selected embraces within a radius of 125 miles some 80 per cent. of the total population of England. It should, therefore, have a wide appeal to the general public, whether they wish for thrills or for quiet recreation.

The member from the House also endeavoured to link up the scheme with romance, by suggesting that it might be profitable for visitors to seek the lost treasure of King John, but Col. the Master of Sempill, in his usual accurate and inimitable manner, brought this suggestion to earth by pointing out that during the war the particular area where the treasure was supposed to have been lost was used as a practice bombing ground, and that, while many of the bombs exploded, there were large numbers which did not; in consequence, searching for buried treasure might mean that the searchers would be in danger of being rapidly transported to other regions. From our own point of view, the establishment of a really well-run Aerodrome and Gliding School in this district, which is one of the parts of England with the smallest annual rainfall, would no doubt be of great value to aviation, and it is for this reason, if for none other, that we trust the scheme will go forward.

It may, perhaps, be grandiose and magnificent in its conception, and would at first sight seem beyond the bounds of possibility, but, given the necessary capital, of course, anything can be done, and, whether or not an adequate return can be obtained for this outlay is entirely a matter for the promoters, and we can but hope that they will see their way to obtaining a satisfactory return and thereby place the whole scheme upon a sound footing.

HONOUR TO MR. GRIFFITH BREWER

ON Saturday, May 9, Mr. Griffith Brewer was the guest of honour at a luncheon given by the Hanworth Club at Hanworth. The occasion was by way of celebrating the fortieth anniversary of Mr. Griffith Brewer's first flight, which took place in a balloon from Chelsea.

Readers will remember that Mr. Griffith Brewer held his first function as President of the Chartered Institute of Patent Agents at Hanworth Park last year, and on this occasion he also celebrated the fact of his return to aviation. Since that time he has flown his own Moth regularly at Hanworth, and is a shining example to many others who look upon themselves as being too old to fly.

COL. THE MASTER OF SEMPILL was in the chair, and said how glad he was to have an opportunity, on behalf of Hanworth Club, and the Committee of the Royal Aero Club, to welcome Mr. Griffith Brewer. Mr. Brewer, he said, was one of the original members of the Royal Aero Club, and also of Hanworth. He mentioned many others who were present and who could claim, together with Mr. Brewer, to be pioneers of aviation. Second only to Mr. Brewer, he said, as their chief guest, was Mrs. Griffith Brewer, who, by flying to France in a balloon in 1906, was the first lady to cross the Channel by air.

Reference was made to the association that Mr. Griffith Brewer had always had with the Wright Bros., of whom Orville Wright had taught him to fly, and to Mr. Griffith Brewer's present activities with his own privately-owned machine at Hanworth.

MR. GRIFFITH BREWER himself, with great modesty, referred to his past flights, and to some of the successes he had had, both in distance flights and in landing at selected points. There was nothing quite like ballooning, he said, and it held thrills which were quite absent from modern



A view taken at Hanworth on this occasion. Mrs. Griffith Brewer is holding the presentation cigarette box, with Mr. Griffith Brewer on her right. On the extreme right of the photograph is Mr. Griffith Brewer, Jr.

flying, chief of which was the thrill of not knowing in the least where you were going.

The war, he said, had killed ballooning, and now that people were able to buy small machines and fly cheaply, he did not think it likely that it would be resuscitated.

MR. M. L. BRAMSON, as Chairman of the Hanworth Club Committee, made a speech, in which he drew attention to the extraordinary contrast in character which Mr. Brewer presented, in that he was reckless by going off in balloons, while at the same time, in his job as a Patent Agent, he had to be extremely careful and meticulous as to detail. He then, on behalf of the club, presented Mr. Brewer with a silver cigarette box, suitably inscribed, as a mark of esteem and to commemorate the anniversary. This box was beautifully engraved with a balloon on one side, dated 1891, and Mr. Griffith Brewer's own Moth on the other side, dated 1931.

“FLIGHT” (COPYRIGHT) POSTCARDS

IN response to many requests, sets of FLIGHT copyright photographs in postcard form, as detailed below, have been prepared and are now ready for issue. These are real photographs and are made up in sets of six. The cost of each set is 2s. post free. In each set will be included one extra photograph (see * below) from our historical collection, and, where possible, this is a prototype of those included in the set. Any of our readers who desire to obtain these remarkable records should remit 2s. per set (specifying the particular sets desired) to the Publishers, 36, Great Queen Street, Kingsway, London, W.C.2.

The twelve sets make a very complete collection of photographs of modern aircraft.

Set No. 1.—**Single Seater Fighters** : Westland Wizard, Bristol Bulldog, Gloster Gamecock, Fairey Firefly, Hawker Fury, Armstrong Whitworth Siskin, and *Sopwith Tabloid.

Set No. 2.—**Day Bomber and General Purpose Machines** : Hawker Horsley, Westland Wapiti, Fairey Fox, Hawker Hart, Fairey III F, Armstrong Whitworth, Atlas and *B.E. 2c.

Set No. 3.—**Twin-Engined Bombers and Troop Carriers** : Handley Page Hinaidi, Vickers Virginia, Handley Page Clive, Handley Page 19/27, Boulton and Paul Sidstrand, Handley Page Hyderabad and *Cody Biplane.

Set No. 4.—**“Pictorial” Photographs** : Short Singapore over the Medway, No. 43 Squadron in formation, Fairey III F landing on H.M.S. *Glorious*, No. 601 Squadron in the clouds, A Hinaidi off on a night raid, No. 17 Squadron in formation, and *Sunset flying at pre-war Hendon.

Set No. 5.—**“Stunt” Photographs** : Avro Lynx crazy flying, Handley Page “Gugnunc” leaping off, No. 43 Squadron in “Flights Astern,” Hawker Hawfinch “ground strafing,” Hawker Fury fighting, Broad on D.H. Moth inverted, and *Hamel en Vol Plane.

Set No. 6.—**Large Machines** : Handley Page 0/400, Armstrong Whitworth Argosy, Beardmore Inflexible, Dornier Do.X, Handley Page Hannibal, Short Kent and *Rucker Rhomboidal.

Set No. 7.—**Flying Boats** : Supermarine Southampton, Blackburn Iris, Saunders-Roe Cloud, Short Singapore I, Blackburn Sydney, Saunders-Roe Cutty Sark and *Supermarine P.B.I.

Set No. 8.—**Commercial Machines** : Vickers Vellore, Gloster Air Survey, Avro 10, Armstrong Whitworth Argosy, Avro 6, Westland Wessex and *Enclosed Avro.

Set No. 9.—**Commercial Machines** : Short Calcutta, De Havilland Hercules, Short Valetta, Handley Page W.10, Avro 5, Handley Page Hannibal and *Grahame White Char-a-banc.

Set No. 10.—**Private Owner Types** : De Havilland Gipsy Moth, Blackburn Bluebird, Parnall Elf, Comper Swift, De Havilland Hawk Moth, Klemm Monoplane and *Short Biplane.

Set No. 11.—**Private Owner Types** : Robinson Redwing, De Havilland Puss Moth, Desoutter II, Hendy 302, Spartan Arrow, Cierva Autogiro and *Avro Triplane.

Set No. 12.—**Private Owner Types** : Southern Aircraft Martlet, Boulton and Paul Phoenix, Avro Avian, Segrave Meteor, Saunders-Roe Cutty Sark, Junkers Junior and *Barber's Valkyrie.

AIRISMS FROM THE FOUR WINDS

London—Berlin Record

CAPT. FRANK HAWKS has added another record flight to his list by flying from London to Berlin in 2 hr. 57 min. He left Croydon, on the "Texaco 13" Travel Air monoplane, at 11.58 a.m., May 12, and reached Tempelhofer Aerodrome at 2.55 p.m. Incidentally, it is stated that he arrived in Berlin before the arrival of a telegram from London saying he had started!

America—Hungary Flight

Two Hungarian airmen, Capt. G. Endresz and Lt. A. Magyar, propose, all being well, to start to-day on a flight from Harbour Grace, Newfoundland, to Budapest, about 3,500 miles. They will be flying a Lockheed "Sirius" named "Justice for Hungary."

A Bulldog Victory in Australia

THE Victorian Aerial Derby in Australia over a distance of forty miles has been won by Flying Officer Henry, on a Bristol "Bulldog." He averaged a speed of 185 miles an hour.

An Airship School

CAPT. F. L. M. BOOTHBY, R.N. (rtd.), has written to *The Times* of May 9, urging the establishment of an airship school to provide continuity in airship work. He recalls that an Experimental Station was once established at Pulham, but it was abolished after the war. A school would also provide training for officers and crews.

Graf Zeppelin

DR. ECKENER paid a visit to Paris recently to discuss with the French Air Ministry the establishment near Paris of an international airship station for the proposed Zeppelin service between Berlin and New York in 1933. Dr. Eckener said that M. Dumesnil had given a favourable reception to the scheme, and the airship station at Orly was inspected. The scheme will be submitted to the French Cabinet. It is also reported in *The Times* that Dr. Eckener has made an agreement with the Hearst Press for a scientific expedition by airship to the Polar regions, with the main object of establishing contact with, and if possible to meet at or near the North Pole, the expedition of Sir Hubert Wilkins in the submarine *Nautilus*. It is hoped to find out whether the airship is a suitable means of landing expeditions in the Arctic regions, and of subsequently locating and reshipping them, or, alternatively, of provisioning and relieving expeditions already there. The *Graf Zeppelin* will carry an outfit including sledges, boats, clothing, and provisions against emergencies. Eight or nine scientists and explorers, as well as a woman pas-

senger, will accompany the expedition, in which Germany, the United States, Great Britain, and Russia will be represented. With the crew there will probably be 45 persons on board. In addition to this Arctic flight, *Graf Zeppelin* is to make three non-stop flights from Friedrichshafen to Pernambuco, Brazil, this summer, the first late in August.

Rescue of Mr. Courtauld

MR. AUGUSTINE COURTAULD has been reached and rescued by the sledge party headed by Mr. H. G. Watkins. All four men returned safely to the base at Taddusiak by May 11. Capt. Ahrenberg, the Swedish pilot, flew over the Greenland ice cap on May 7 and saw the party marching back to the base. He sent off the good news by wireless and then flew back himself. In recognition of his share in the rescue work the Swedish Aero Club has awarded its gold medal to Captain Ahrenberg.

Geodetic Flying Operations

CANADIAN aeroplanes flew almost five hundred hours in connection with the transportation requirements of the various parties of the Geodetic Survey of Canada (Department of the Interior) in northern Quebec during the field season of 1930. At times as many as five separate parties were altogether dependent on the aeroplanes for the transportation of food and other necessary supplies. The same detachment also flew seventy-five hours on photographic work.

French Air Manœuvres

SOME 150 aircraft were engaged in combined naval and air manœuvres round Toulon for three days recently. M. Dumesnil, the Air Minister, was present. The object was to test the defences of the district.

The Blackpool International Aviation Meeting

WE understand that the proposal to hold an International Aviation Meeting at Blackpool, July 8—11, has been abandoned.

Aeronautical Institute for Tokio

THE Aeronautical Research Institute of Tokio Imperial University was opened in the presence of the Emperor on May 11. It is believed to be the largest and best equipped of its kind in the world.

Over One Million Hours in the Air

THE aged Turk, Zaro Agha, who lays claim to 156 years, had his first flight at Brooklands on May 11, and, incidentally, doubled the age record of a flying school which had previously boasted a pupil of 75, Sir Horace Plunkett, as its oldest devotee.



This side view of Capt. Hawks in the Travel Air "Texaco 13" shows how, by means of his adjustable seat, he is able to raise himself and, having pushed the top part of the windscreen forward, thus obtain a good view when approaching an aerodrome.

Flew into a Hill

WING COMMANDER T. E. B. HOWE, A.F.C., of the Directorate of Training, Air Ministry, was flying from Leuchars from Catterick, on May 8, while on a tour of inspection, in a Fairey III F. Visibility got bad, and shortly after noon the machine crashed into a hill at Great Busby, 12 miles from Middlesbrough. The wing commander suffered serious injuries to his head, but the passenger in the back seat was unhurt.

Memorial Service for Glen Kidston

ABOUT three thousand people thronged the Johannesburg Cathedral on May 10, in the nave of which the coffins of Lieutenant-Commander Glen Kidston and Captain Gladstone, covered with flags, rested temporarily before being shipped to England.

Fl.-Lt. Waghorn Dead

WE regret to announce that Flight-Lieutenant Henry Richard Danvers Waghorn, A.F.C., died in hospital on May 7, from injuries sustained as the result of the accident which occurred at Farnborough to a Horsley aircraft of the Experimental Section, Royal Aircraft Establishment, South Farnborough, on May 5, 1931. Flight-Lieutenant Waghorn, who was the pilot of the aircraft, and Mr. E. R. Alexander, his passenger (who was slightly injured), were carrying out a test flight when the accident occurred, and their injuries were received in making forced parachute descents from a height of about 500 ft. The Secretary of State for Air has received from General Balbo, Italian Minister for Air, the following message of sympathy on the death of Flight-Lieutenant Waghorn:—

"It is with great regret that I have heard the tragic news of the death of your great airman Waghorn, whom I knew and held in high esteem, and I wish at once to express sincerest condolence to British aviation both on my own behalf and on that of the Royal Italian Air Service."

The funeral of Flight-Lieutenant Waghorn took place at St. Thomas-on-the-Bourne, Farnham, on May 11. Bishop Golding-Bird, the Rev. T. F. Griffith, and the Rev. W. L. W. Kitching officiated. The wreaths included one from the Italian Air Force and one from the Italian Schneider Trophy team.

Another Great Gift from Sir Charles Wakefield

THE historic Thomas à Becket Cup—or the Howard Grace Cup—the property of the Duke of Norfolk, was sold at Christie's on May 12 for £11,000, the purchaser being Lord Wakefield, who has given it to the Victoria and Albert Museum.

Sir William Morris, D.C.L.

OXFORD University, on May 12, honoured its leading citizen in the industrial world, Sir William R. Morris, when in Convocation in the Sheldonian Theatre he received the honorary degree of D.C.L.

Guggenheim Medal for F. W. Lanchester

MR. F. W. LANCHESTER, formerly member of the Advisory Committee for Aeronautics, has been awarded the 1931 Daniel Guggenheim Gold Medal for achievement in aeronautics.

An Air Union Reception

THE Air Union will receive Capt. Dieudonne Costes at Croydon on May 30. This is the first occasion upon which Capt. Costes has visited England since his flight from Paris to New York last year. Capt. Costes is now Inspector-General of the Air Union, and a lunch will be held in his honour at the Aerodrome Hotel, at which His Excellency M. de Fleuriau, the French Ambassador, will preside. A flight of five Golden Ray air liners will be sent out from

Croydon to welcome Capt. Costes and escort him to the Aerodrome.

Sport at Stag Lane

THE De Havilland Aircraft Co.'s new sports ground and fully licensed clubhouse which adjoins Stag Lane Aerodrome will be officially opened on May 16 by Capt. Geoffrey De Havilland. The afternoon's programme includes a Ladies v. Gentlemen's cricket match, athletics, a football match, tennis, etc. All visitors, particularly those who arrive by air, will be welcome.

Botes Voladores Anfibios Saro.

THIS is the title of the Spanish edition of a catalogue produced by Saunders-Roe, Ltd., of East Cowes, Isle of Wight, England. The catalogue deals briefly with the history of the firm, and contains descriptions, data and photographs of the three types of amphibian aircraft produced up to the present, namely, the "Cutty Sark," the "Cloud" and the "Windhover." The catalogue is very attractively printed on blue "sky effect" paper, and we are informed that Saunders-Roe, Ltd., will be pleased to send a copy to any Spanish reader of FLIGHT who applies either to the address given above or to the London Office, Bush House, Aldwych, London, W.C.2.

For Aviation Motorists

THE British Petroleum Company are issuing an interesting little leaflet, called "News of the Road," which all our motoring readers may obtain from the British Petroleum Co., Ltd., Britannic House, Moorgate, E.C.2, on mentioning FLIGHT. The current issue for May gives some details of the new B.P. "Plus" Spirit, which has been doped to give it a higher knock value. The centre spread has a series of illustrations, and we are glad to see that the aviation interest is not forgotten, as it includes a picture of the baptism of one of the new Sports Avians which has been delivered to the B.P. Company.

The Tour of France

BAD weather delayed the finish of the Tour of France, and as a result we have been unable to give our report in this week's issue—but we will do so next week. However, we understand that 40 out of the 42 starters returned to Orly on May 10.

A Cirrus for Satisfaction

LORD WILLOUGHBY DE BROKE recently made a tour of the Continent covering 2,350 miles in 29½ flying hours. His machine was a Klemm, with a Cirrus III engine, and he and his passenger together weighed 30 stone. Throughout the whole of the trip the engine only received maintenance by the occupants of the aircraft, and never gave a minute's trouble; even on cold mornings starting was a simple matter. It is flights like these by private owners, who admittedly have not a very large experience, which go such a long way towards popularising a good article like Cirrus and Hermes engines.

Merriam's Aviation Bureau

WE are informed that Merriam's Aviation Bureau has been transferred to Archery Grove, Woolston, Southampton, where Mr. Merriam and his colleagues are carrying on the business of advising people who wish to learn flying, or people in the aviation industry who desire positions as pilots, designers, draughtsmen, ground engineers, etc. Mr. Merriam has on his lists a rather unique collection of names and firms, and anyone wanting advice on any subject in connection with aviation is advised to communicate with him at the address given above.



THE NEW SHELL-MEX AVIAN (GIPSY II): This aircraft has recently been added to the Shell fleet, as we announced in FLIGHT for February 20, and is fitted with Dunlop Semi-Balloon Aero Wheels. With the split axle undercarriage and the sports tyre fuselage top fairing it should be an exceptionally pleasant machine.

THE DEVELOPMENT OF THE LONG-RANGE FLYING BOAT

By MAJOR J. D. RENNIE, A.R.T.C., A.M.Inst.C.E., F.R.Ae.S.

(Concluded from page 416)

If we now compare these four types of stabilisers with respect to weight, air drag, and water resistance, it will be found that the retractable inboard float type possesses an important advantage uncommon with wing-tip floats, and with little disadvantage in the other respects.

With regard to weight and air drag, the order of merit is:—

- (1) Wing-tip floats.
- (2) Fixed inboard floats.
- (3) Retractable inboard floats.
- (4) Stubs.

Now, other things being equal, the time to take off and the maximum load which can be taken off depend upon the combined water resistance of the hull and stabilisers, and, taking the hull and wing-tip float arrangement as a basis, the order of merit in this respect is found to be, from the results of tank tests on the "Sydney" hull:—

- (1) Wing-tip floats.
- (2) Fixed inboard floats.
- (3) Dornier type stubs.

With inboard floats or stubs, the increase in resistance, especially of the latter, was found to be considerable up to speeds about ten knots above the hump speed. Hence again, the retractable inboard floats have the advantage inasmuch as the water resistance need be little, if any, more than for wing-tip floats, as, if the boat is on an even keel and the wing-tip floats clear of the water, then the inboard floats may be retracted and so offer no further water resistance.

If the practicability and the advantages to be gained by the adoption of retractable inboard floats be admitted, then we have progressed one step further towards seaworthiness comparable with the corresponding surface craft. Having arrived at probably the best possible arrangement of hull stabilisers, we must now turn our attention to the remainder of the structure, as clearly, the arrangement should be such that it is exposed to the least possible chance of damage concomitant with aerodynamic requirements. To meet this requirement, the wings, propellers, and the tail unit should be placed as high above the hull as possible. This would seem to be the only common-sense arrangement, and the obvious thing to do. Yet a study of the layout of many modern boats shows that an attempt to attain seaworthiness in this respect, either has been neglected or the importance not realised.

We are now in a position to specify the basic features which must be incorporated in the design in an endeavour to comply with this specification. These may be enumerated as under:—

- (1) Clean running deep "Vee" hull.
- (2) Retractable inboard floats.
- (3) Propeller tips clear of spray and solid water.
- (4) High-wing monoplane.

In the case of item (4), a biplane wing arrangement would meet the requirement, provided the dimensions were such that the lower plane was at the same height above the sea level as the minimum water clearance found necessary for the monoplane wing.

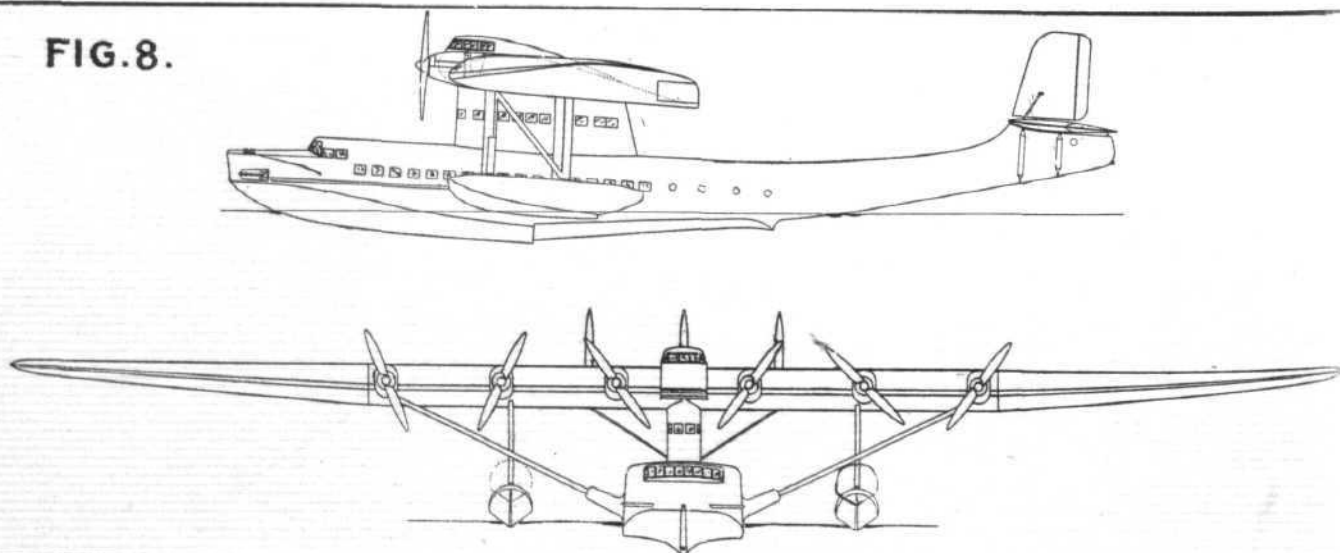
So far no mention has been made of size. Obviously, other things being equal, the larger the boat the greater the degree of seaworthiness. The question then arises, what is the minimum size of flying boat? A reliable decision in this respect can only be forthcoming as the result of years of accumulated experience in operations under all sorts of conditions. In these times progress must inevitably be slow, because, owing to the present world-wide acute economic situation, capital, either publicly subscribed or obtainable through the usual channels, is not available for the carrying out of an extensive constructional and operational programme. The rate of progress will depend, therefore, in a great measure, on the ability of the engineer to make full use of all the experience available, and to arrive at the minimum economic size with the least possible expenditure and delay.

While it would be unwise to attempt to predict the minimum size to meet this specification, nevertheless, experience would seem to indicate that the normal gross weight would be between thirty to forty tons. If powered with six engines of about 800-1,000 h.p. each, giving an aggregate of about 5,000-6,000 h.p., the normal horse-power loading would be 13-14 lbs./h.p. If the landing speed be not less than 60 knots, then this h.p. loading should lead to a fairly high air performance. The possibility of designing to this horse-power loading will depend, of course, on the military load specified and the technique of the structure design.

Fig. 8 shows one version of a proposed monoplane design to fulfil the requirements of this specification. It may be taken as a possible layout for the medium size, six-engined flying boat outlined above. It will be seen all the fundamental features determined have been incorporated in the design. The deep "Vee" hull bottom, without which no flying boat can have any pretence to seaworthiness, is shown as developed from extensive full-scale and tank tests. The hull is totally enclosed and structurally strong enough to withstand all reasonable sea conditions likely to be encountered. Retractable inboard floats are fitted as shown and operated by the pilot. The wing, engines, propellers and tail unit are situated well above the hull deck and are clear of all solid water. The pilot's control bridge is arranged centrally above, and just forward of, the leading edge of the wing, thus providing a unique view ahead and on the port and starboard bows. Immediately abaft of the pilot is the engineer's cockpit, from which there is access in flight to all engines.

With regard to the question of accessibility of the engines in flight in order to carry out minor repairs or adjustments, there are two difficulties to be overcome if

FIG. 8.



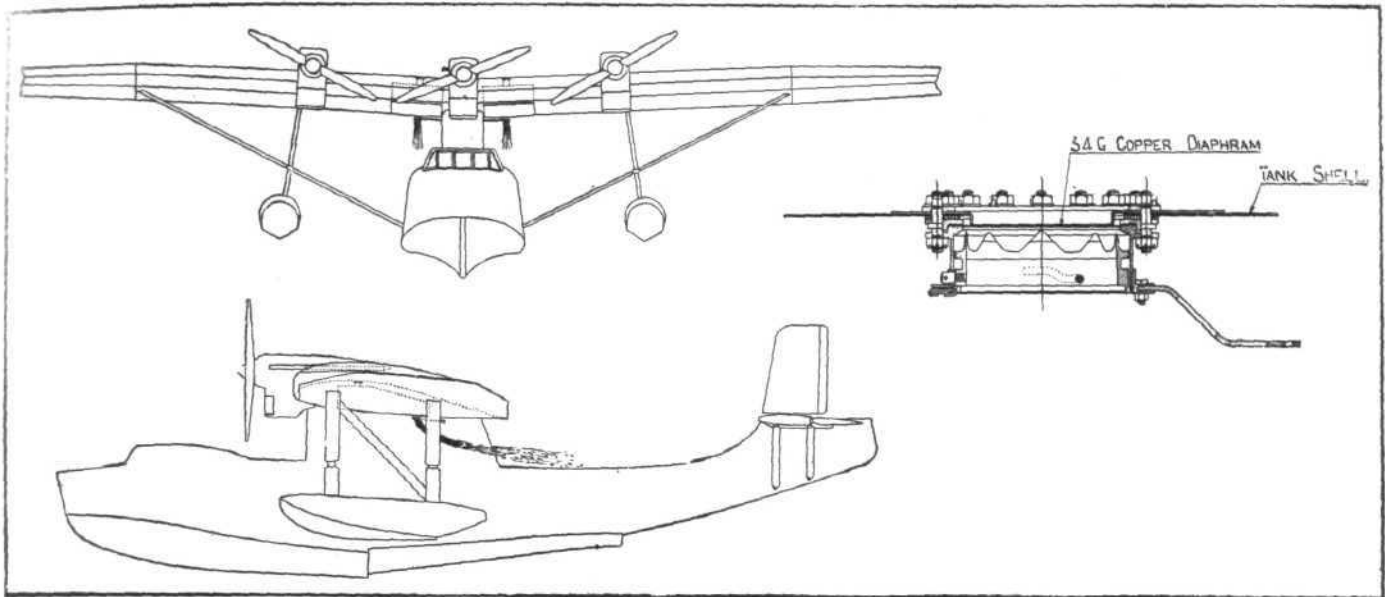


Fig. 9. Fuel Jettison Arrangement.

the whole engine is to be accessible. If the engines are fitted in the wing or in nacelles large enough for access to all parts, then trouble will be experienced in cooling the exhaust manifolds. Any solution to this problem will be unsatisfactory from the weight and reliability point of view. In the former case, in addition to the above, propeller shafts and housings have to be fitted, which entails a further increase in weight and may lead to serious torsional vibration. What is really required, as the best compromise for the present, is that the engine makers should fit all engine accessories, such as water and oil pumps, filters, carburettors and magnetos at the rear end of the engine where they would be readily accessible.

Between the hull deck and the lower surface of the wing, and directly below the pilot's bridge, is situated the navigation bridge. This position gives an unrestricted all-round view, and, with the protection available, should satisfy all navigational requirements.

The officers' and crew's quarters and all general equipment are arranged inside the hull, from which a companionway leads to both bridges.

The fuel tanks are placed inside the wing and fitted with jettison valves operated by the engineer.

On the whole, the lay-out obtained would appear to result in a sound practical design of quite a pleasing appearance.

We will now proceed to treat briefly several of the more important detail design considerations, which contribute largely to the efficiency and ease of operation. These are "The Fuel Jettison Arrangement," "The Flight Controls," "The Arrangement of Fuel Tanks," and, lastly, "Fuel Economy."

The Fuel Jettison Arrangement

The argument, which is sound and practical, in favour of the ability to jettison fuel in emergency, is that the boat can then take-off with the maximum load possible under the conditions prevailing, and, all being well, will complete the flight as arranged. On the other hand, in the event of engine failure, sufficient fuel may be jettisoned to lighten the aircraft in order that flight may be continued either to the specified destination or to the nearest base.

Fig. 9 shows an arrangement as applied to wing tanks, and inset, the type of jettison valve used. The arrangement shows that once the valve is opened, the escaping fuel is blown clear of the aircraft by the propeller slipstream, and hence all risk of fire is eliminated. The valve arrangement consists of a stainless steel flanged circular base of from 4 in. to 6 in. internal diameter, bolted to the lowest part of the tank bottom shell. On this base is formed a circular corrugated seat. An outer flanged ring, with a similar seating, is bolted to the base ring, the corrugated seatings forming the joint for a 34 S.W.G. soft copper disc, which is the valve proper. In this outer ring is fitted a steel circular ring on which are formed triangular-shaped stepped cutters. This cutter may be

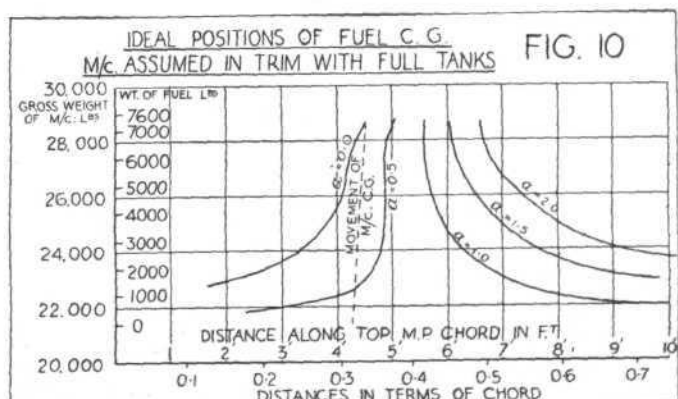
given an upward and rotating motion by means of a lever operated from any convenient position. The cutter, therefore, pierces and cuts round the disc, which then falls clear and allows the fuel to escape. A new disc would require to be fitted prior to re-fuelling. It will be seen that the arrangement shown is light, simple, safe and effective.

The Flight Controls

It is fundamental to the success of a flying boat of the size contemplated that it should not be tiring to fly for lengthy periods. It is, therefore, necessary that the controls should be light to operate and well matched. There is no valid reason why, with increase in size, the controls should become heavier to operate, as analogous to the case of the rudder operation of large ships in which lightness of control is obtained by the use of Flettner-type servos or some form of mechanically-operated servo-motor, mainly the latter, we have at our disposal similar means of operation in the now well-known aerodynamic servo-control system and the mechanically-operated gyro-controlled "Assister Pilot."

In conjunction with the above systems of control operation, the control surfaces would be balanced aerodynamically by, preferably, some form of the backward hinge method by means of which static balance of the control surfaces (of importance with regard to the avoidance of flutter) presents little difficulty.

In the multi-engined aircraft, the rudder control is probably the most important, as, in the event of an outboard engine failure, rudder has to be carried to balance the loss in thrust moment. In the design proposed, there are three all-moving rudders, an arrangement which has been successfully tested on the "Sydney." The centre, or trimming rudder, is operated by means of a lever in the pilot's cockpit, and is used for adjusting the directional trim in the case of engine failure, etc., while the outer, or control, rudders are connected to the rudder bars in the usual manner. With this arrangement, and it is a point



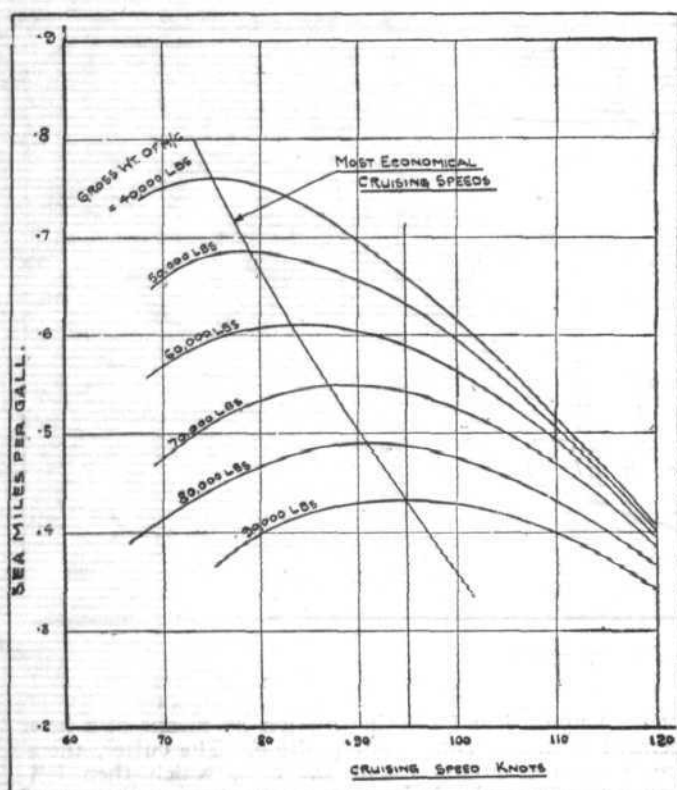


Fig. 11. Consumption Curves.

of considerable importance, there is an ample reserve of rudder power available for control, over and above that required to balance any change of directional trim due to engine failure. In this connection, the conditions which must be satisfied for an aeroplane to fly in a straight horizontal path do not seem to be generally recognised. In the event of wing engine failure, these conditions are as follows:—

- (1) The thrust must be equal to the drag.
- (2) There must be no resultant lateral force.
- (3) There must be no moment about the centre of gravity of the aircraft.

(1) is satisfied if flight is possible and height maintained. To satisfy (2), a force (—F) equal and opposite to the side force on the yawed rudders must be applied either by the aeroplane flying one wing down and thus using a component of its weight, or by flying slightly yawed, or by a combination of both. (3) is satisfied if the rudder power is such that the yawing moment is zero. From the pilot's point of view (3) must be satisfied, and should be clearly realised and allowed for by the appropriate control settings.

The Arrangement of Fuel Tanks

As the weight of fuel required for a range of 1,000 sea miles up to the "limit" range varies from about 25 to 40 per cent. of the gross weight, it will be realised that, unless special precautions are taken with regard to change of trim as the fuel is consumed, there may be insufficient tail plane adjustment or elevator control lift available for manoeuvrability. In short duration aircraft this is of minor importance, and the C.G. of the fuel generally is close to the C.G. of the aircraft. It will be shown, in what follows, that ideal positions of the centre of gravity of the fuel may be obtained, which will satisfy the condition that, at a constant speed, say, the cruising speed, there shall be no change of fore and aft trim as the fuel is consumed.

Let us assume that the aircraft with full tanks is in trim, fore and aft, at a constant speed V . Then, if an amount of fuel is consumed, the angle of incidence will be reduced to maintain the same level speed. This gives rise to a pitching moment about any point, and the aircraft, therefore, will be out of trim in this new attitude. If, however, the centre of gravity of the remaining fuel is arranged, either by tank position and shape, or by some form of selective overflow, to be in such a position that it provides a moment to balance the change in aerodynamic pitching moment, the aircraft will remain in trim, at the

same speed, irrespective of fuel consumption. In other words, if M is the pitching moment, and M' the fuel moment, then the criterion for no change of trim is $dM/da = dM'/da$ when a is the angle of incidence.

While in practice it is not always possible wholly to satisfy this condition, it is apparent that every effort should be made to reduce the change of trim, as the fuel is consumed, by some such self-trimming arrangement, in such a manner that the change in control settings, to obtain balance, should be a minimum.

Fig. 10 shows the locus of the ideal position of the fuel centre of gravity for the "Iris III" wing tanks, and the dotted line the actual fuel C.G. travel. Even as shown, there was a marked improvement over the "Iris II" arrangement, in which particular care had not been taken in the design in this respect.

Fuel Economy

It will be apparent, as the fuel weight required for long range is, as we have seen, a considerable proportion of the total weight, that fuel conservation is of the utmost importance. If it is not used economically, then, apart from increasing the all-up weight for a given range, it nullifies to an appreciable extent the effort made to reduce structure weight, the difficulties of which increase with the size of the aircraft.

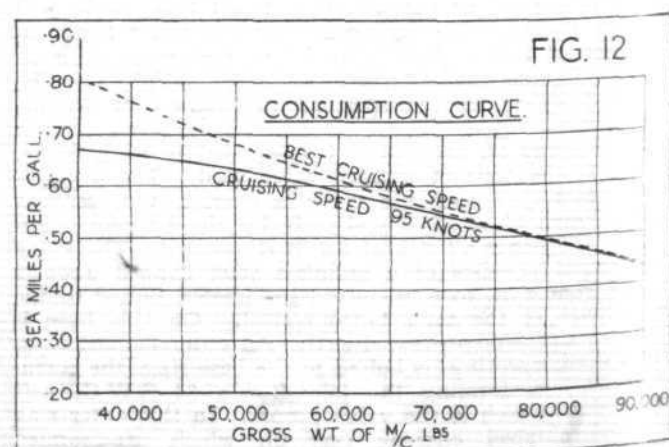
Fig. 11 shows typical throttled consumption curves, in which, for different weights, the sea miles per gallon are plotted against speed. The speed, corresponding to the peak of each curve, gives the most economical cruising speed—that is, the speed at which the sea miles per gallon are a maximum, and is found to be not far different from 1.5 times the stalling speed.

As these curves are comparatively flat, it will be observed that the most economical speed is not uniquely defined, and may be exceeded with little sacrifice in fuel economy. It may be remarked that a reduction in specific fuel consumption has little effect on the cruising speed, but increases the range for the same fuel capacity.

Also, these curves show that the cruising speed increases with weight or, the same thing, stalling speed. This is shown more clearly in Fig. 12, in which the sea miles per gallon are plotted against weight, the full-line curve for a constant speed of 95 knots, and the dotted curve at the most economical speed. From either of these curves the range may be calculated, and it is found there is little difference in both cases, the former having the advantage in that, for the same range, the duration of flight is reduced. As the curves are practically straight lines, it should be noted that the sea miles per gallon are, for all practical purposes, proportional to the weight.

With the advent of a reliable flowmeter, devised by the staff of the R.A.E., which gives a direct indication of the rate of fuel consumption, it is now possible to control the mixture strength, and hence to run the engine on the leanest mixture without loss of power.

Extensive tests in service have shown that, with pilots flying in formation without flowmeters or specific instructions as to the use of mixture control, the variation in consumption may be as high as 45 per cent., and by the use of mixture control this figure has been reduced to 25 per cent. By fitting flowmeters as an aid to the determination of the best mixture, this figure has been further reduced to within 6 per cent. and the relative consumption reduced from .745 to .566 lb./b.h.p./hr.



THE ROYAL AIR FORCE

London Gazette, May 5, 1931

General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank:—N. V. Bertram (Mar. 20); G. V. Barber, K. B. B. Cross, M. V. Johnstone, L. E. P. Mahon, R. W. H. Rayneau, G. M. Williams (April 11). Pilot Officer on probation G. M. Gillan is confirmed in rank and promoted to rank of Flying Officer (April 13). The follg. Pilot Officers are promoted to rank of Flying Officer (April 11):—J. N. Baxter, M. Q. Candler, V. A. Dawson, H. M. Gahan, F. B. H. Hayward, E. G. Reed, C. H. Williams.

The follg. are promoted with effect from May 6:—Flight Lieutenant to be Squadron Leader.—A. R. Churchman, D.F.C. Flying Officers to be Flight Lieutenants.—R. F. Shenton, H. F. G. Southey, E. B. Webb, P. W. Lowe-Holmes, D. V. Ivins. C. P. Ashton-Jinks, V. G. A. Hatcher, H. J. Walker, W. L. Bateman, R. H. Donkin.

Flight Lt. C. W. Hill is restored to full pay from half-pay (April 22); Lt. P. Bethell, R.N., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to Naval duty (April 22); Pilot Officer on probation E. G. B. Kiddley resigns his short service comm. (April 25); the short service comm. of Pilot Officer on probation C. Cheshire (Sec. Lt. A.I.R.O.) is terminated on cessation of duty (Mar. 31).

Medical Branch

Flight Lt. P. J. Nyhan, M.B., B.Ch., is transferred to Reserve, Class D(ii), and is employed with Regular Air Force for one year (May 2).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

Lt. Commander E. H. D. Spence, R.N. (retd.), is granted commission in Class A as Flight Lt. (March 4); Pilot Officer on probation N. J. Tindal is confirmed in rank (April 29). The follg. Pilot Officers on probation of Special Reserve are confirmed in rank:—R. Heathcote (Feb. 22); M. M. Hutchinson (Feb. 22); P. W. J. Pharaoh (April 18). The follg. Flying Officers relinquish their comm. on completion of service (April 20):—G. R. Beck, H. E. W. MacAndrew.

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON. Flying Officer (Hon. Flight Lt.) R. A. Grosvenor, M.C., resigns his comm. (Dec. 1, 1930). No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON. Pilot Officer B. P. A. Valance is promoted to rank of Flying Officer (April 12).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodores: P. H. L. Playfair, M.C., H.Q., R.A.F., India, for duty as Chief Staff Officer, 28.3.31. F. W. Bowhill, C.M.G., D.S.O., to H.Q. Fighting Area, Uxbridge, on appointment as Air Officer Commanding, on relinquishing the appointment as Director of Operations and Staff Duties, 4.5.31.

Squadron Leader: C. E. W. Lockyer, to R.A.F. Depot, Aboukir, 25.4.31. E. A. Beaulah, to H.Q., Wessex Bombing Area, Andover, 23.4.31. C. F. Horsley, M.C., to R.A.F. Base, Calshot, 30.4.31. C. Porri, to School of Photography, S. Farnborough, 4.5.31. T. F. W. Thompson, D.F.C., to No. 1 Air Defence Group H.Q., 1.5.31.

Flight Lieutenants: T. H. French, D.F.C., to H.Q., Iraq Command, Hinaidi, 25.4.31. C. M. Heard, to R.A.F. Practice Camp, Catfoss, 10.3.31. D. J. Harrison, to No. 32 Sqn., Kenley, 27.4.31. C. W. Hill, to Home Aircraft Depot, Henlow, 22.4.31. W. M. M. Hurley, to Marine Aircraft Experimental Estab., Felixstowe, 1.5.31. H. F. Luck, to R.A.F. Depot, Uxbridge, 11.4.31. C. R. Hancock, to No. 25 Sqn., Hawkinge, 1.5.31. C. N. H. Bilney, to Station H.Q., Upper Heyford, 3.5.31. W. F. Dry, to Marine Aircraft Experimental Estab., Felixstowe, 10.4.31. W. E. Symonds, to No. 501 Sqn., Bristol, 5.5.31. G. H. Stainforth, to Marine Aircraft Experimental Estab., Felixstowe, 7.4.31.

Flying Officers: N. H. Thompson, to No. 4 Squadron, S. Farnborough, 10.4.31. T. M. Abraham, to R.A.F. Practice Camp, Catfoss, 10.3.31. G. F. Overbury, to R.A.F. Practice Camp, Catfoss, 9.3.31. G. E. F. Proctor, to R.A.F. Practice Camp, Sutton Bridge, 10.3.31. L. E. Chiswell, to R.A.F. Practice Camp, North Coates Fitties, 10.3.31. C. C. D. Williams, to R.A.F.

Depot, Uxbridge, 19.3.31. W. G. H. Ewing, to R.A.F. Depot, Uxbridge, 26.3.31. H. A. J. de S. Barrow, to No. 19 Sqn., Duxford, 27.4.31. H. H. Leech, to Marine Aircraft Experimental Estab., Felixstowe, 7.4.31. H. B. Collins, E. Esmonde, both to R.A.F. Base, Gosport, 3.5.31. F. J. B. Keast, to No. 26 Sqn., Catterick, 27.4.31. M. G. C. Chadwick, to No. 16 Sqn., Old Sarum, 27.4.31.

Pilot Officers: W. O. J. Coke, to No. 3 Flying Training School, Grantham, 25.4.31. E. J. N. Heaven, to No. 207 Sqn., Bircham Newton, 7.4.31. M. F. Summers, to No. 1 Sqn., Tangmere, 29.4.31. P. A. de G. Tattenborn, to No. 3 Flying Training School, Grantham, 29.4.31.

Stores Branch

Flight Lieutenant: C. T. Davis, to Aircraft Depot, Karachi, instead of to No. 1 (Indian) Group, Peshawar, as previously notified, 13.3.31.

Flying Officers: E. E. Copper, G. A. Durnford, both to R.A.F. Depot, Aboukir, 25.4.31. G. J. E. Parsons, S. W. Thomas, both to Aircraft Depot, Hinaidi, 25.4.31. J. E. R. Sowman, to No. 33 Sqn., Bicester, 26.4.31. L. H. Anness, A.F.C., to Home Aircraft Depot, Henlow, 13.4.31.

Pilot Officers: J. R. Fraser, H. A. Sudbury, E. G. Moore, all to Home Aircraft Depot, Henlow, 13.4.31.

Accountant Branch

Flying Officer: W. F. Quilliam, to No. 47 Sqn., Khartoum, 18.4.31.

Medical Branch

Flight Lieutenant: A. S. Burns, to Medical Training Depot, Halton, on appointment to a short-service comm., 14.4.31.

Flying Officer: E. Corner, to H.Q., R.A.F., India, Simla, 24.4.31.

IN PARLIAMENT

Air Mail Stamps and Publicity

THE POSTMASTER-GENERAL (Mr. Attlee), on April 20, in reply to Rear-Admiral Sueter, said: I do not anticipate that any appreciable amount of additional revenue would accrue from the sale of air mail stamps. The only useful purpose to be served by an air mail stamp would be to indicate that a letter is intended for transmission by air; but as in practice it would be impossible either to limit the prepayment of air mail letters to air mail stamps, or to prevent the use of such stamps on ordinary letters, this purpose could not be attained. The necessary indication is already given clearly and satisfactorily by the blue air mail label, which is prescribed by the International Air Mail Convention and can be obtained free of charge at any post office.

Sir Samuel Hoare: How is it that the Postmaster-General says that there is no advantage to be gained by air stamps when almost every other country in the world is getting great advantages from them?

Mr. Attlee: I am informed that no advantage is gained. **Mr. Attlee,** in reply to Mr. Allen, said: Any member of the public desiring to use the air mail can obtain full particulars of the available facilities from the air mail leaflet which is obtainable free of charge at any post office; and particulars of air mail despatches are given in the Post Office daily list, which has a wide circulation among business houses. New services instituted and all important alterations made receive wide publicity through the Press, the daily list, and the British Broadcasting Corporation.

Airship Policy

Mr. MONTAGUE, on April 28, in reply to Mr. O. Lewis, said His Majesty's Government have now decided to postpone a final decision on the policy of the Government as to the building of further airships pending a report by the Committee on National Expenditure on the financial situation.

Aerodromes

Mr. MONTAGUE, in reply to Mr. Day, said the number of licensed aerodromes at the beginning of this year was 122. The number of new licences

issued during 1930 was 288, of which 228 were issued for periods of six months or less.

Royal Dutch Air Lines

THE SECRETARY OF STATE FOR INDIA (Mr. Wedgwood Benn), on April 29, in reply to Lt.-Com. Kenworthy, said, with unimportant interruptions a regular fortnightly service from Amsterdam to Batavia has been operated (by the Royal Dutch air lines), since September, 1930, and I understand that this service will be run as a weekly one from October 1 next. Progress is being made with the ground organisation in India and Burma as funds permit, and a chain of landing grounds along the trans-India route from Karachi to Victoria Point is now in regular use.

Auxiliary Squadrons

Mr. MONTAGUE, in reply to Capt. Balfour, said no new auxiliary Air Force squadron is being formed during 1931.

Overhead Electric Cables

Mr. MONTAGUE, in regard to overhead electric cables, said meetings have taken place between representatives of the Air Ministry and the Electricity Commissioners regarding the guarding of aircraft from danger of contact with overhead high-tension cables, by means of lighting of pylons or some other means, and the technical aspects of the subject are under active consideration. A programme of experiments is being drawn up.

Experimental Aircraft

Mr. MONTAGUE, on May 6, in reply to Capt. Balfour, said there are at present no experimental types of civil aircraft owned by the Air Ministry, but five aircraft of such types are now under construction to the Air Ministry's order. These aircraft—a large float seaplane, a freight-carrier landplane, a flying boat, a monoplane landplane and a biplane landplane—are intended to achieve definite advances in design over existing types. On completion they will be flown experimentally under operational conditions, and the ultimate use to which they will be put will depend upon the results of these experiments. The question of selecting and placing orders for further experimental types of civil aircraft is under consideration.

The R.A.F. Display

SMALL bills have now been issued for the Royal Air Force Display, which will be held at Hendon on Saturday, June 27, in aid of R.A.F. charities. The programme will include Crazy Flying, Individual and Flight Aerobatics, a Parachute Event, Air Drill by Squadrons, a Fly Past of Flying Boats, Parade of New and Experimental Types, and an Air Attack on a Base. Last year £9,000 was

handed over from the takings of the Display to the R.A.F. Memorial Fund.

The Oswald Watt Medal

THE Associated Australian Aero Clubs have awarded the Oswald Watt Medal for 1930 (for the most outstanding feat by an Australian-born pilot) to Air Commodore Kingsford Smith for his flights from Dublin to Newfoundland and from Croydon to Darwin.

THE INDUSTRY

Spartan Aircraft Changes

MR. O. E. SIMMONDS, late Chief Designer of the Spartan Aircraft Co., has disposed of his interests, and has severed his connection, with the Company. The registered office of the Simmonds Interchangeable Wing Co., Ltd., is now at Stevenage House, Holborn Viaduct, E.C.1, and it is to this address that all communications to Mr. Simmonds should be directed. Consequent upon the new arrangement of Spartan Aircraft, Ltd., whose business has now been transferred to East Cowes, Isle of Wight, Sir Alliott Verdon Roe, Mr. John Lord and Mr. H. E. Broadsmith have become Directors.

It will be remembered that Spartan Aircraft, Ltd., was formed in 1928, and was one of the earliest of the new firms. From its commencement its success was exceptional, and repeat orders were obtained from no less than twelve countries in its first year's trading. Mr. O. E. Simmonds was also Managing Director of the Hampshire Aeroplane Club, Ltd., for three years, during which time the record of the club was extremely satisfactory. It is only after the firm has now been securely established and is being controlled by other financial interests than Mr. Simmonds has seen fit to sever his connection. We sincerely hope that he will not be lost to aviation, and that some other firm will shortly see the value of his previous commercial and technical experience.

Handley Page, Ltd.

In the annual report to December 31 last of Handley Page, Ltd., the Directors announce a profit of £43,146 10s. 8d., which, with £15,240 14s. balance brought forward, gives a total of £58,387 4s. 8d. The Directors recommend a final dividend of 5 per cent. on the Preference Shares (making, with the Interim Dividend already paid, 10 per cent. for the year), absorbing £19,914 8s.; a bonus of 2½ per cent. on the Preference Shares (£4,978 12s.) and the same amount (£4,978 12s.) on the Ordinary Shares, leaving a balance to be carried forward of £28,515 12s. 8d.

Napier Changes

OWING to the death of Mr. M. S. Napier, the late Chairman and Joint Managing Director of D. Napier & Son, Ltd., certain changes have been made in the management. Mr. H. T. Vane, C.B.E., who has been Joint Managing Director and General Manager since 1913, the year in which the Company was formed, is now Chairman and Managing Director. Mr. F. A. Davies, who has been Secretary for a similar period, and who was appointed to a seat on the Board four years ago, has taken over the position of General Manager. Mr. R. C. Johnson is now Secretary of the Company.

The Edison Storage Battery

THE formal Order was recently published in the case of Edison Storage Battery Company v. Britannia Batteries, Limited, Edison Accumulators, Limited, and J. F. Monnot. Mr. Justice Bennett had, on March 18 last, granted an injunction against the defendants, Britannia Batteries, Limited, and Edison Accumulators, Limited, and the Order embodying this decision restrains these two defendants, their respective officers, servants and agents "from selling, offering for sale, or advertising any accumulators or storage batteries not of the manufacture of the plaintiffs as 'Edison' accumulators or batteries, and from representing that they are manufacturers of Edison batteries, and from otherwise passing off or attempting to pass off such goods as and for the plaintiffs' goods by the use of the name Edison or otherwise." It may be of interest to note that the Edison Storage Battery Co. intends to place on the market Edison batteries specially suited to aeronautical requirements, where a considerably reduced weight in comparison with other types of storage batteries will form the principal feature.

New Address of Tecalemit, Ltd.

TECALEMIT, LTD., announce that as from May 2 their address is changed to Tecalemit, Ltd., Great West Road, Brentford, London. Telephone: Ealing 6661.

Air Taxis

AIR TAXIS, LTD., who have offices at Stag Lane (Edgware 0234/5) and Croydon (Fairfield 5346), with emergency night numbers at Gladstone 1906 and Harrow 1932, have just issued a small booklet which tells those who wish to hire an air taxi all about their machines. This is interesting for those who wish to fly either for pleasure or to make fast business calls, and we advise such people to write for a copy to Air Taxis, Ltd., Stag Lane, mentioning FLIGHT.

PUBLICATIONS RECEIVED

The Naft. A. P. O. C. Magazine. March, 1931. The Anglo-Persian Oil Co., Ltd., Britannic House, Finsbury Circus, London, E.C.2.

Elementary Applied Aerodynamics. By T. G. Whitlock. Oxford: The Oxford University Press. London: Humphrey Milford. Price, 12s. 6d. net.

Cycling Manual. 9th Edition. London: Temple Press, Ltd. Price 1s. net.

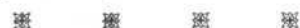
Model Aeroplanes and Airships. By F. J. Camm. London: George Newnes, Ltd. Price 1s.

An Hour of Aviation. By Capt. Norman Macmillan, M.C., A.F.C. London: Gerald Duckworth and Co., Ltd. Price 3s. 6d. net.

In the Cool of the Evening. By Elliott White Springs. London: John Hamilton, Ltd. Price 7s. 6d. net.

Trafford Park. Information Bureau, Trafford Park Estates, Ltd., Trafford Park, Manchester.

Aeronautical Research Committee Reports and Memoranda: No. 1350. Reports and Memoranda Published between September 1, 1929, and December 31, 1930. January, 1931. Price 6d. net. No. 1357. Variable Density Wind Tunnel Test Data on Models of the Hawker "Hornbill" Aeroplane and the AD-1 Aerofoil Section. By W. S. Diehl and R. F. Anderson. June, 1930. Price 1s. net. H.M. Stationery Office, Kingsway, London, W.C.2.



IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1930 being given in FLIGHT, January 16, 1931.

	Imports.		Exports.		Re-exports.	
	1930.	1931.	1930.	1931.	1930.	1931.
Jan. ...	2,987	7,965	147,935	142,596	—	1,074
Feb. ...	2,460	3,303	226,049	110,587	1,000	1,293
Mar. ...	744	5,615	156,098	83,088	802	3,441
April ...	2,959	2,216	213,390	213,401	79	530
	9,150	19,099	743,472	549,672	1,881	6,338



AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1929

Published May 14, 1931

34,887. A. W. and Z. W. Daw. Rotary i.c. engine. (346,686.)

APPLIED FOR IN 1930.

Published May 14, 1931

- 1,431 G. DE HAVILLAND and DE HAVILLAND AIRCRAFT CO., LTD. Aircraft. (346,707.)
 1,937 GLOSTER AIRCRAFT CO., LTD., H. S. HELE-SHAW, T. E. BEACHAM and H. L. MILNER. Airscrews. (346,844.)
 3,877. SIR F. H. ROYCE. Means for regulating i.c. engines for aircraft. (346,892.)
 10,234. A. J. NORTHEY. Rotary i.c. engine. (346,973.)
 12,841. H. C. THOMPSON and H. P. HARRINGTON. Aeroplanes. (347,002.)
 18,346. J. F. ZIEGLER. Supporting-planes for aircraft. (347,051.)

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